



Checklist of treehoppers of Panama (Hemiptera: Membracidae) with a list of checklists and keys to the Nearctic and Neotropical fauna

DAWN J. FLYNN

Entomologist and Curator of Life Sciences, Schiele Museum of Natural History, 1500 East Garrison Blvd., Gastonia, NC 28054

E-mail: dawnjf@cityofgastonia.com

Abstract

A checklist of treehoppers (Hemiptera: Membracidae) of Panama is provided with known province distribution data. The world catalogue of Membracoidea, through 1996, lists 68 genera, 162 species, and 1 subspecies from Panama (McKamey, 1998). New research in Panama has documented range extensions for 29 genera, 107 species, and 1 subspecies previously unknown from Panama. With these adjustments and additions, the total treehopper fauna from Panama includes 97 genera, 269 species, and 2 subspecies. Tables listing published checklists and keys for Nearctic and Neotropical treehoppers are presented.

Key words: Membracidae, treehoppers, checklist, Panama, nearctic checklist citations, neotropical checklist citations

Treehoppers are a family of hemipterous insects that are distinguished by unusual shapes of the pronotum. The development and variety of these shapes are at their peak in the Neotropics. Numerous checklists and keys of treehoppers are available for the Nearctic Region (Table 1) but there have been few faunal distribution studies of treehoppers of the Neotropics even fewer with keys (Table 2). No separate faunal study or checklist of the treehoppers of Panama has been published.

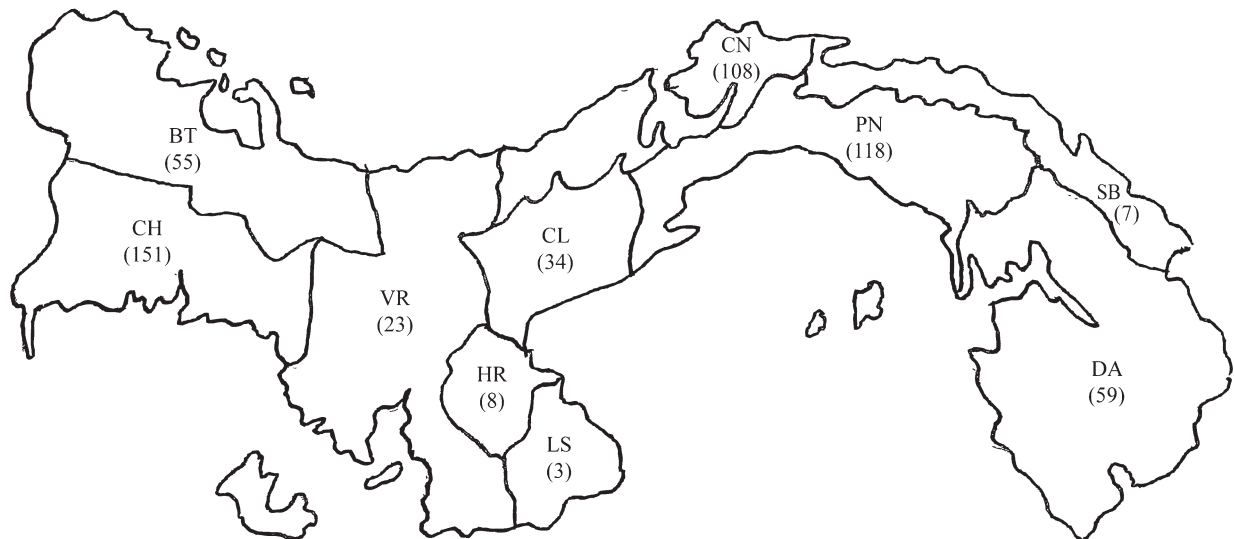
Since McKamey's World Catalogue of Membracoidea (1998), the revisionary works by Albertson and Dietrich (2005, 2006), Andrade (2003, 2004), Creão-Duarte and Sakakibara (1996, 2000a, 2000b), Cryan & Deitz (1999a). Cryan *et al* (2003), Flynn (2003), Sakakibara (1998, 1999, 2002, 2005), Sakakibara and Creão-Duarte (2002), and Sakakibara and Evangelista (2008), have created new genera, synonymized genera, revised subgenera, and added new species to the listed 68 genera, 162 species, and 1 subspecies from Panama.

Materials and methods

The following checklist of species is based on a total of 2,825 specimens studied from two field seasons of collecting in Panama. Field collecting was done in Chiriquí, Panama, and Darien provinces during January 2005 and May 2006 between wet and dry seasons when insect activity is at its highest. Abbreviations for the institution holdings examined follows Arnett Jr., R.H., Samuelson, G.A. and G.M. Nishida (1993) except for the private collections.

(DJFC) USA, North Carolina, Gastonia, Dawn J. Flynn Collection,
(DMWC) Panama, Balboa, Smithsonian Tropical Research Institute, Don Windsor Collection,
(NCSU) USA, North Carolina, Raleigh, North Carolina State University Insect Collection
(STRI) Panama, Balboa, Smithsonian Tropical Research Institute
(HWIC) Panama, Balboa, Smithsonian Tropical Research Institute, Wolda Collection
(UDCC) USA, Delaware, Newark, University of Delaware
(UGCA) USA, Georgia, Athens, University of Georgia
(MIUP) Museo de Invertebrados "G.B. Fairchild," Universidad de Panamá
(USNM) USA, Washington, DC, United States National Museum

Each specimen was examined under a binocular microscope and genitalia dissected when needed for species identification. Keys and descriptions from published works for Neotropical treehopper genera and species known from Central and South America were consulted for identifications. Published catalogues and country checklists for Central American and South American species were consulted to check for additional distribution records (see Table 2). Verification of species identifications was done by examining authoritatively identified specimens in institutions visited and discussions with other acknowledged authorities. All specimens were identified by the author unless otherwise noted.



MAP 1. Map of Panama Provinces with number of species () recorded from each province: BT=Bocas del Toro, CH=Chiriquí, CL=Cocle, CN=Colon, DA=Darién, HR=Herrera, LS=Los Santos, PN=Panama, SB=San Blas (= Comarca de Guna Yala), VR=Veraguas, [Canal Zone = “Canal Area” (17): for species list see Table 5]

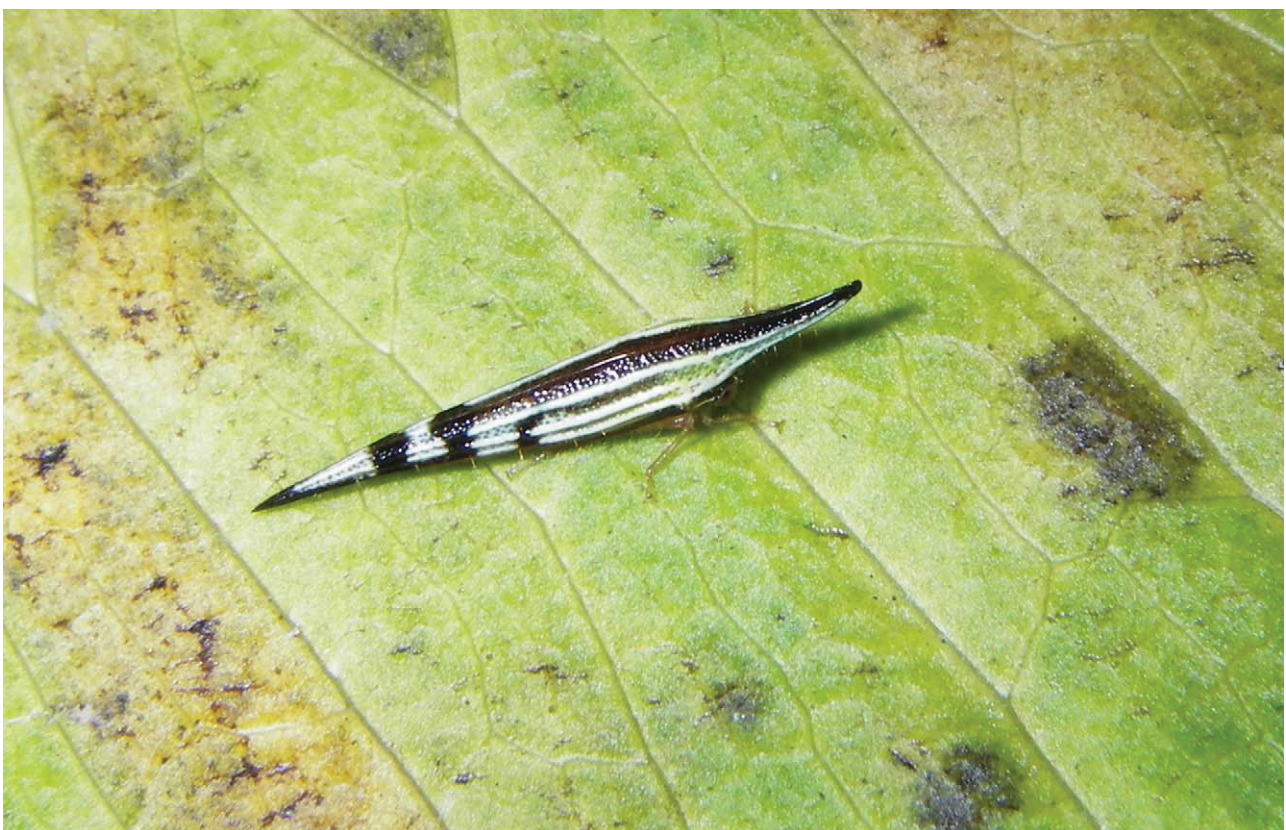


FIGURE 1. *Polyglypta dorsalis* Burmeister taken at Fortuna Dam, Chiriquí Province, Panama.

TABLE 1. List of treehopper species checklists and keys for the Nearctic Region and (Areas). An * indicates those checklists that have keys.

Checklist State (Area)	Citation
California (San Diego County)	Van Duzee, E.P. 1914a
Colorado	Gillette, C.P. & C.F. Baker 1895a
Connecticut	Britton, W.E. 1920a, 1938c
Connecticut*	Funkhouser, W.D. 1923c
Delaware	Mason, L.E. & J.E. Loye 1981a
Delaware (Water Gap Nat. Rec. Area)	Wallace 2008
Delaware (deciduous woodlot)	Mason, L.E. & Loye, J.E. 1981b
Florida	Osborn, H. 1921a
Iowa	Hookum, D.W. 1931a
Iowa (prairie)	Hendrickson, G. O. 1928a, 1930a
Indiana	Deay, H.O. & G.E. Gould 1935a
Kansas*	Lawson, P.B. 1922a
Kentucky	Freytag, P.H., Covell Jr., C.V. & D.D. Kopp 1981a
Kentucky (pin oak)	Johnson, M.P. & P.H. Freytag 1997
Maryland (Little Orleans Campground)	Bartlett, C.R. <i>et al.</i> 2008
Maryland (marshes)	Bickley, W.E. & T.R. Seek 1975a
Missouri*	Kopp, D.D. & T.R. Yonke 1973a–c, 1974a
Missouri (Tucker Prairie)	Kopp, D.D. & T.R. Yonke 1970a
Missouri	Kopp, D.D. & T.R. Yonke 1970b, 1971a
Nebraska	Jones, H.C. 1937a
New Jersey	Smith, J.B. 1910a
New Mexico (White Sands Nat. Mon.)	Stroud, C.P. 1950a
New York (Adirondack Mountains)	MacGillivray, A.D. & C.O. Houghton 1903a
New York	Leonard, M.D. 1928a
New York (Cayuga Lake Basin)*	Funkhouser, W.D. 1917a
North America*	Van Duzee, E.P. 1908a
North America (catalogue)	Goding, F.W. 1893a
North America (catalogue)	Van Duzee, E.P. 1917b
North America (catalogue)	Poole, R.W. <i>et al.</i> 1997
North Carolina	Brimley, C.S. 1938a; Dietrich <i>et al.</i> 1999
Ohio*	Osborn, H. 1940a
Oklahoma*	Dennis, C.J. 1965a
Oklahoma (SE Okla. woods)	Dennis, C.J. 1964c
Oklahoma (Southern Okla. wood)	Dennis, C.J. 1963a
Pennsylvania (Pocono Till Barrens)	Wallace, M.S. & S.M. Maloney 2010
Pennsylvania (western)	Wirtner, P.M. 1904a
South Dakota	Severin, H.C. 1921b, 1923b, 1927a
Tennessee/NC (Gr.Smokey Mts Nat Park)	Wallace, M.S. <i>et al.</i> 2003
Utah	Jorgensen, D.D. 1935a
Washington, DC Vicinity	McAtee, W.L. 1921a
Wisconsin*	Dennis, C.J. 1952b
Wisconsin	Dennis, C.J. 1951a
Wisconsin (Univ. of Wisc. Arboretum)	Dennis, C.J. & R.J.Dicke (1953a)
Canada	Brodie, W. & J. E. White 1883a
Canada and Alaska	Maw, H.E. <i>et al.</i> 2000
Canada (Alberta)	Strickland, E.H. 1953a

continued on next page.

Table 1 (continued).

Checklist State (Area)	Citation
Canada (British Columbia)	Downes, W. 1920a
Canada (Nova Scotia)*	Brittain, W.H. 1918a
Canada (Ontario)	Lerch, E.C. 1933a
Canada (Mukoka Lake Dist, Ontario)	Van Duzee, E.P. 1889b
Canada (Como, Quebec)	Moore, G.A. 1907a
Canada (Hudson Heights, Quebec)	Moore, G.A. 1944a
Canada (Quebec)	Moore, G.A. 1950a, 1950b; Larivière & Larochelle 1988a
Canada (Quinze Lake, Quebec)	Van Duzee, E.P. 1908b
Canada (Rainbow River District)	Brimley, J.F. 1929a

TABLE 2. List of treehopper species checklists and keys for the Neotropical Region. An * indicates those checklists that have keys.

Checklist Country (Area)	Citation
Argentina	Box, H.E. 1929b; Christensen, J.R. 1943a
Bahamas	Metcalf, Z.P. 1954c
Brazil	da Costa Lima, A.M. 1942a
Brazil (southeastern)	Lopes, J.F. 1995
British Guiana (Kartabo)	Haviland, M.D. 1925a
Chile	Goding, F.W. 1925b; Linnavuori, R.E. & D.M. DeLong 1978a
Cuba	Osborn, H. 1926c, Metcalf, Z.P. & S.C. Bruner 1925b
Tropical America (emphasizing Costa Rica)	Godoy <i>et al.</i> 2006
Colombia	Richter, L. 1940a, 1941b, 1942c, 1945a, 1955a
Dominican Republic*	Ramos, J.A. 1979a
Dominican Republic (Mona Island)	Ramos, J.A. 1947a
Ecuador	Campos, F. 1921a, Goding, F.W. 1920a, 1920b, 1921a
Ecuador*	Goding, F.W. 1920c
Greater Antilles (Zoogeography)	Ramos, J.A. 1988a
Guatemala	Funkhouser, W.D. 1943d
Haiti	Wolcott, G.N. 1927b
Central America	Fowler, W. 1894b, 1894c, 1895a–f, 1896b–e
Panama (Barro Colorado Island)	Curran, C.H. 1929a
Peru	Ceballos-Bendezú, I. 1967a, 1980a
Peru (Kallanga, Cusco)	Ceballos-Bendezú, I. 1981a
Peru (Manu National Park)	Costa, J.F. 2009
Puerto Rico	Wolcott, G.N. 1950a
Puerto Rico*	Osborn, H. 1935a, Ramos, J.A. 1957a
South America and the Antilles*	Goding, F.W. 1926e, 1928a, 1928e, 1929e
Uruguay*	Goding, F.W. 1914a, 1920a–c, 1921a
West Indies (Vincent Island)	Goding, F.W. 1893b

Discussion

Interest in treehoppers has spawned a number of checklists for both the Nearctic and Neotropical regions. However there is a disparity in the number of states and/or provinces covered versus countries.

Checklists and keys to the Nearctic region (Table 1) cover 18 continental states, 18 areas (including Washington, DC), 6 Canadian provinces, and 5 Canadian areas. Among the papers for the Nearctic are 10 keys for 7 continental states, 1 key for North America (Van Duzee 1908a) and 1 check-list for North America (Van Duzee, 1923a).

In contrast, a listing of the checklists and keys to the Neotropical Region (Table 2) includes 7 countries, 5 areas, a series of keys by Goding covering all of South America (1926e, 1928a, 1928e, 1929e), Fowler's *Biologia Centrali-Americana* (1894b, 1894c, 1895a-f, 1896b-e) covering Central America and Godoy's recent book on generic identification for tropical America (2006). Also 6 Caribbean islands and 1 Caribbean area are cited. Keys to Neotropical treehoppers are available for Uruguay (Goding 1914a, 1920a-c, 1921a), Ecuador (Goding 1920c), Chile (Goding 1925b), Puerto Rico (Osborn 1935a, Ramos 1957), and the Dominican Republic (Ramos 1979a). Despite this recent progress towards more fully documenting the Neotropical fauna, the distributions of most species and faunistic components of most countries remain poorly known. The contribution of this checklist for Panama will add much new distributional information for treehoppers in Central America.

Presence of ten species recorded in literature as occurring in Panama could not be confirmed (Table 3). Among these *Alchisme veruta* Fowler is the only one originally described from Panama. No specimens of these species were seen to verify their presence in Panama but they are included to provide a complete literature review. Examination of more specimens is needed to determine the validity of the published records

TABLE 3. Listing of 10 species (alpha by genus) recorded in literature from the country of Panama only with literature citation.

Species	Originally described from	Literature citation
<i>Alchisme turruta</i> (Germar)	Brazil	Goding 1929e: 207
<i>Alchisme veruta</i> Fowler	Panama	Fowler 1894c: 33 as <i>Triquetra veruta</i>
<i>Cladonota inflata</i> (Fowler)	Guatemala	Haupt 1953a: 35 as <i>Sphongophorus inflatus</i>
<i>Cladonota robustula</i> (Fowler)	Guatemala	Peláez 1945a: 64
<i>Enchenopa multicastrata</i> Fowler	Mexico	Goding 1928e: 210
<i>Hebeticoides acuta</i> Fowler	Guatemala	Buckton 1903b: 119 as <i>Hebeticoides acutus</i>
<i>Heteronotus glandiferus</i> (Lesson)	Brazil	Buckton 1903b: 141 as <i>Heteronotus vulnerans</i> (Germar)
<i>Heteronotus reticulatus</i> (Burmeister)	Brazil	Goding 1929e: 249 as <i>Heteronotus vulnerans</i> (Germar)
<i>Umbonia amazali</i> Fairmaire	N.A.	Goding 1929e: 205
<i>Vanduzeei decorata</i> Funkhouser	Peru	McKamey 1998: 239

Among the species listed for Panama an additional two are questionable: *Alchisme turruta* (Germar), and *Tolania fraterna* Stål. Complete discussion is found under each species account.

Barro Colorado Island (BCI) is located in Gatun Lake in the middle of the Panama Canal. Curran (1929a) gives notes on a few of the more common species found in the 1929 survey of the island while still part of the Canal Zone. In 1979 BCI, with five adjacent peninsulas, administered by the Smithsonian Institution (Smithsonian Tropical Research Institute (STRI)), was designated the Barro Colorado Nature Monument. It is visited by researchers from throughout the world. Henk Wolda sampled extensively on BCI for 7 years (1977-1983), using UV light traps, many of which were at three levels from the ground to the canopy (Wolda 1979a, 1980a, 1982a, 1983a). A list of the 71 species recorded from Barro Colorado Island, Colon Province, most of which came from H. Wolda's collection at STRI, is found in Table 4.

The Panama Canal traverses both Colon and Panama Provinces and many specimen data labels examined with location Canal Zone did not delineate which province the specimen was collected. Those species with such unspecified Canal Zone province data are listed in Table 5. As a result of the Torrijos-Carter Treaty of 1977, the "Canal Zone" is now known as the "canal area".

Map 1 delineates each province of Panama with the number of species found in each province cited under each province abbreviation. San Blas is now known as Comarca de Guna Yala but is listed by San Blas as it is the more familiar name. Examination of the number of species recorded from each Province shows the most species found in Chiriqui (151), Colon (108), and Panama (118). The fewest species recorded were from Herrera (8), San Blas (7), and Los Santos (3). The low species diversity in the aforementioned three Provinces is most likely due to: (1)

undersampling; (2) poor habitats in Los Santos and Herrera provinces (vegetationally depauperate) because area consists almost entirely of cattle ranches; (3) political issues in San Blas (predominantly Indian Reservation where it is difficult to get permission to collect). The Panama Canal, which traverses both Colon and Panama Provinces, and the presence of the University of Panama in the Panama Province, appear to provide opportunities for more extensive collecting. Barro Colorado Island (BCI), owned by Smithsonian Institute, as an international biosphere reserve, is visited and studied by thousands of scientists worldwide, providing extensive sample data.

TABLE 4. Listing of 71 species (alpha by genus) recorded from Barro Colorado Island, Colon Province, Panama.

Species	Species
<i>Adippe inaequalis</i> Fowler	<i>Harmonides reticulata</i> (Fabricius)
<i>Amastris angulata</i> Broomfield	<i>Heteronotus spinosus</i> Laporte
<i>Amastris concolor</i> Broomfield	<i>Heteronotus trinodosus</i> Butler
<i>Amastris froeschneri</i> Broomfield	<i>Horiola picta</i> (Coquebert)
<i>Amastris subangulata</i> Broomfield	<i>Hypsoprora coronata</i> (Fabricius)
<i>Anobilia nigra</i> Tode	<i>Idioderma virescens</i> Van Duzee
<i>Aspona bullata</i> Stål	<i>Ishnocentrus inconspicuus</i> Buckton
<i>Aphetea inconspicua</i> Fowler	<i>Ishnocentrus niger</i> Stål
<i>Bolbonota aurosericea</i> Stål	<i>Lallemandia nodosa</i> Funkhouser
<i>Bolbonota corrugata</i> Fowler	<i>Leioscyta nitida</i> Fowler
<i>Bolbonota globosa</i> Fairmaire	<i>Membracis dorsata</i> Fabricius
<i>Bolbonota inaequalis</i> (Fabricius)	<i>Membracis mexicana</i> Guérin-Meneville
<i>Bolbonota inconspicua</i> Fowler	<i>Microtalis binaria</i> (Fairmaire)
<i>Bolbonota pictipennis</i> Fairmaire	<i>Microtalis henki</i> Sakakibara
<i>Bolbonota rufonotata</i> Fowler	<i>Microtalis infuscata</i> Sakakibara
<i>Brachybelus cruralis</i> Stål	<i>Microtalis trifurcata</i> (Goding)
<i>Calloconophora pinguis</i> (Fowler)	<i>Nassunia bipunctata</i> (Fairmaire)
<i>Campylenchia hastata</i> (Fabricius)	<i>Neotynelia pubescens</i> (Fabricius)
<i>Centrotus obscurus</i> (Germar) [formerly in <i>Tolania</i>]	<i>Neotynelia vertebralis</i> (Fairmaire)
<i>Chelyoidea aenea</i> (Perty)	<i>Notocera bituberculata</i> (Fowler)
<i>Cladonota apicalis</i> (Stål)	<i>Poppea zebrina</i> Funkhouser
<i>Cladonota biclavata</i> (Westwood)	<i>Potnia gladiator</i> (Walker)
<i>Cyphonia clavata</i> (Fabricius)	<i>Potnia granadensis</i> (Fairmaire)
<i>Cyphonia trifida</i> (Fabricius)	<i>Procyrtia pectoralis</i> (Fabricius)
<i>Darnis latior</i> Fowler	<i>Stictopelta acutula</i> (Germar)
<i>Darnis trifasciata</i> Fabricius	<i>Sundarion apicalis</i> (Germar)
<i>Enchenopa ansera</i> Funkhouser	<i>Sundarion auriculatum</i> (Stål)
<i>Enchenopa bifusifera</i> Walker	<i>Tolania femoralis</i> Stål
<i>Enchenopa ignidorsum</i> Walker	<i>Tolania opponens</i> (Walker)
<i>Enchophyllum lanceolatum</i> (Fabricius)	<i>Tomogonia vittatipennis</i> (Fairmaire)
<i>Enchophyllum melaleucum</i> (Walker)	<i>Trachytalis retrofasciata</i> (Lethierry)
<i>Endioastis caviceps</i> Fowler	<i>Trinaria carinata</i> (Funkhouser)
<i>Guayaquila fasciata</i> Dietrich	<i>Tropidarnis tectigera</i> Fowler
<i>Guayaquila gracilicornis</i> (Stål)	<i>Tynelia longula</i> (Burmeister)
<i>Harmonides dispar</i> (Fabricius)	<i>Vanduzeeia segmentata</i> (Fowler)
<i>Harmonides panamensis</i> C.-D. & Sakak.	

Results

What follows is a checklist of known species in Panama with new range extensions for species previously unknown from Panama. The new research in Panama treehoppers has documented range extensions for 29 genera, 107 species, and 1 subspecies previously unknown from Panama. With these new range extensions, the treehopper

fauna known from Panama includes 97 genera, 269 species, and 2 subspecies. An ‘*’ after the author’s name of a species indicates a new record for that species in Panama, verified through a visual identification of one or more specimens. An ‘**’ after the author of a species indicates a new record for that species in Panama through literature citation only (specimens from Panama were not seen by the author). Following a ‘*’ and ‘**’ is a list of the provinces (Map 1) in Panama (underlined) where each species has been recorded, municipalities, # of specimens seen for each sex, and deposition location for voucher specimens if the record is taken from seen specimens. Species records for the country of Panama only (no province given) is noted by verbage ‘Country (Panama) only’ with literature citation following the species. Species records for a Province only is noted by verbage ‘Province only’ with literature citation following the species. Literature citations also follow province records where no specimens have been seen by the author from that province. The letter suffixes following citation dates are those used in the major bibliographic references for the Membracoidea through 1996: Metcalf and Wade (1965a); Deitz and Kopp (1987a); Deitz (1989a); McKamey (1998). Post 1996 refernces have no letter suffixes.

TABLE 5. Listing of 17 species (alpha by genus) recorded from Canal Zone = “canal area” (Panama/Colon Provinces unspecified).

Species	Species
<i>Amastris angulata</i> Broomfield	<i>Microtalis atrovana</i> Goding
<i>Atypa bucktoni</i> Goding	<i>Microtalis bella</i> Goding
<i>Campylenchia hastata</i> (Fabricius):	<i>Microtalis henki</i> Sakakibara
<i>Centrodontus flavus</i> Funkhouser	<i>Microtalis trifurcata</i> (Goding)
<i>Enchenopa ansera</i> Funkhouser	<i>Polyglypta lineata</i> Burmeister
<i>Enchenopa ignidorsum</i> Walker	<i>Potnia brevicornis</i> (Fairmaire)
<i>Hypsoprora anatina</i> Fowler	<i>Sundarion apicalis</i> (Germar)
<i>Ishnocentrus inconspicuous</i> Buckton	<i>Sundarion bimaculata</i> (Fairmaire)
	<i>Trachytalis retrofasciata</i> (Lethierry)

Checklist of Treehoppers of Panama (Hemiptera: Membracidae)

Centronodinae Deitz & Dietrich, 1993

Centronodini Deitz, 1975

Centrodontus flavus Funkhouser, 1930*:

Canal Zone; (1♂: HWIC)

Centronodus denticulus Funkhouser, 1930*:

Colon: Altos de Campaña; Panama: El Llano Carti Rd; (3♀♀: DJFC, UGCA)

Centrotinae Amyot & Serville, 1843

Boocerini Goding, 1892

Brachybelus cruralis Stål, 1869: Bocas del Toro: Miramar, Corriente Grande; Chiriquí: Potrerillos, Reserva La Fortuna: El Vivero, Alto Quiel: 5 km. NW Boquete, Los Planes, Finca la Suiza, 2.5 km. N. Horqueta; Colon: Pipeline Rd., Barro Colorado Island; Panama: El Llano Carti Rd (16♀♀/ 6♂♂: DJFC, NCSU, HWIC, UDCC, UGCA).

Campylocentrus brevicornis Fowler, 1896:

Chiriquí: (Fowler 1896d: 151): Volcán de Chiriquí

Campylocentrus cavipennis (Fowler, 1896)

Chiriquí: Hartmann’s Finca (1♀: UGCA), (Fowler 1896d: 153): Volcán de Chiriquí

Campylocentrus curvidens (Fairmaire, 1846):

Bocas del Toro: Chiriquí Grande; Cocle: Valle de Anton, El Valle; Colon: 8 km. E. Maria Chiquita, Achiote nr. Piña, Fort Randolph, Santa Ridge Rd; Darien: Cana: Cana Station, Cana: Boca de Cupe Trail; Panama: Fort

Kobbe, Cerro Campana, Tumbo Muerto, Coclecito; Veraguas: Alto de Piedra above Santa Fe (22♀/12♂♂: DJFC)

Campylocentrus gibbicornis (Walker, 1858):

Bocas del Toro: (Goding 1928a: 401)

Campylocentrus hamifer (Fairmaire, 1846):

Chiriquí: Cerro Punta, Hartmann's Finca, Los Planes; Darien: P. N. Darien, Pirre Est. Rancho Frio, 10 km. S. El Real, Cana: Cana Mine Trail; Panama: Corazal, Altos de Chase; Veraguas: 2 km. NE Santa Fe (9♀/2♂♂: DJFC, STRI, MIUP)

Campylocentrus pusillus (Fairmaire, 1846)*:

Panama: 0.3 km W. El Llano (2♀: UGCA)

Campylocentrus sinuatus (Fowler, 1896):

Chiriquí: (Fowler 1896d: 152 as *Gnamptocentrus sinuatus* Fowler):
Volcán de Chiriquí

Centriculus rufotestaceus Fowler, 1896:

Chiriquí: (Fowler 1896d: 157): Volcán de Chiriquí

Ishnocentrus fowleri Schmidt, 1927:

Chiriquí: Potrerillos (13♀/16♂♂: NCSU)

Ishnocentrus inconspicuus Buckton, 1903:

Canal Zone: Pipeline Road; Colon: Parq. Rec. Lago Gatun, Barro Colorado Island, Coco Solo Hospital; Darien: Cana: P. N. Darien, 8.5 km. S. El Real; Panama: Camino del Oleoducto, Lago Alajuela metros (altura) (6♀/5♂♂: STRI, UGCA, MIUP)

Ishnocentrus limpidus Schmidt, 1927*:

Darien: Cana: Mine Trail, Cana: River Trail, 2 mi. N. Cana: Escucha Ruido, Cana: Boca de Cupe Trail, P.N. Darian Pirre Est. Rancho Frio (12♀/10♂♂: DJFC, MIUP)

Ishnocentrus niger Stål, 1869:

Chiriquí: Reserva Fortuna: Continental Divide Trail; Colon: Parque Lago Gatun, S. Achiotte, Santa Rita Ridge, Barro Colorado Island; Panama: Parque Soberania: Plantation Trail (6♀/3♂♂: DJFC, STRI, HWIC)

Opficentrus notandus Fowler, 1896:

Chiriquí: (Fowler 1896d: 156): Volcán de Chiriquí

Darninae Amyot & Serville, 1843

Cymbomorphini Haupt, 1929

Cymbomorpha prasina (Germar, 1835):

Chiriquí: Boquete, Fortuna Dam, [Bugaba from Fowler 1895b: 80]; Panama: Cerro Jefe (4♀/4♂♂: HWIC, UGCA)

Darnini Amyot & Serville, 1843

Aspona bullata Stal, 1862*: Colon: Barro Colorado Island, Quebrada Lopez (3♂♂: DJFC, HWIC)

Hypheodana cuneata (Fowler, 1894):

Chiriquí: (Fowler 1894c: 51 as *Aspona cuneata*): Volcán de Chiriquí; Colon: Rio Gaunche (1♀: UDCC)

Hypheodana intermedia (Fowler, 1894):

Chiriquí: (Fowler 1894c: 51 as *Aspona intermedia*): Bugaba; Veraguas: 2 km. NE Santa Fe (1♂: DJFC)

Cyphotes quadrinodosus Fonesca & Diringshofen, 1969*:

Colon: Gatun (1♀: HWIC)

Darnis lateralis (Coquebert, 1801):

Chiriquí: (Goding 1929e: 215 as synonym of *Darnis latior* Fowler, citing Fowler 1894c: 52): Volcán de Chiriquí

Darnis latior Fowler, 1894:

Chiriquí: (Fowler 1894c: 52): Volcán de Chiriquí; Colon: Barro Colorado Island; Darien: P. N. Darien: Pirre

Est. Rancho Frio; Panama: 9 km. ENE El Valle: La Laguna, Cerro Azul, Las Nubes (4♀♀/1♂♂: DJFC, HWIC, MIUP)

Darnis partita Walker, 1858:

Chiriquí: Fortuna, Quebrada Aleman Trail, Bugaba (Fowler 1895a: 52); Darien: Camp Pierre Trail; Panama: Cerro Azul, Cerro Campana (6♀♀/6♂♂:DJFC, HWIC, UGCA)

Darnis trifasciata Fabricius, 1803:

Chiriquí: (Goding 1929e: 215 as synonym of *Darnis partita* Walker, citing Fowler 1895a: 52): Bugaba ; Cocle: La Mesa above El Valle; Colon: Barro Colorado Island; Panama: Cerro Azul, Las Nubes (4♀♀/6♂♂: HWIC, MIUP)

Hebeticoides acuta Fowler, 1894: (Buckton 1903b: 119): Country (Panama) only

Ochrolomia confusus (Fowler, 1894):

Chiriquí: (Fowler 1894c: 54 as *Hebeticoides confusus*): Volcán de Chiriquí

Stictopelta acutula (Fairmaire, 1846):

Chiriquí: Fortuna, Boquete, Quebrada Aleman Trail, Los Planes; Colon: Barro Colorado Island, Quebrada Lopez, Pipeline Rd; Darien: Cana Field Station; Panama: Las Cumbres, Campus de Univ. Panama, Parque Nac. Soberania (23♀♀/17♂♂: DJFC, STRI, HWIC, UGCA, MIUP)

Stictopelta indeterminata (Walker, 1858):

Chiriquí: (Fowler 1895a: 59): Bugaba and Caldera; Darien: Cana Station (1♀: DJFC)

Stictopelta nigrifrons Fowler, 1895*:

Bocas del Toro: Miramar (1 sex unknown: HWIC)

Sundarion apicalis (Germar, 1835)*:

Canal Zone: Pipeline Road; Colon: Barro Colorado Island, (2♀♀/1♂♂: HWIC, UDCC)

Sundarion auriculatum (Stål, 1869)*:

Colon: Barro Colorado Island (sex unknown: HWIC)

Sundarion bimaculata (Fairmaire, 1846)*:

Bocas del Toro: Miramar; Canal Zone: Pipeline Road; Colon: Barro Colorado Island (3♀♀/3♂♂: HWIC)

Hemikypini Goding, 1929

Atypa bucktoni Goding, 1929*:

Canal Zone: Pipeline Rd; Panama: location unknown (1♀/2♂♂: HWIC)

Hyphinoini Haupt, 1929

Hyphinoe asphaltina (Fairmaire, 1846):

Darien: P. N. Darien Pirre Est. Rancho Frio; Panama: Parque Soberania: Plantation Trail (3♀♀: DJFC, MIUP)

Hyphinoe cornuta Distant, 1879:

Bocas del Toro: 9 km. S. Punta de Peña (1♂♂: HWIC)

Hyphinoe diabolica Butler, 1878*:

Chiriquí: 25 km. NNE San Felix (1♂♂: HWIC)

Hyphinoe inermis Goding, 1926*:

Bocas del Toro: Miramar; Cocle: El Cope (3♀♀: HWIC)

Hyphinoe latifrons (Fowler, 1895):

Chiriquí: Fortuna (1♂♂: HWIC), Bugaba (Fowler 1895b: 79)

Hyphinoe obliqua (Walker, 1858):

Chiriquí: (Buckton 1903b: 122 as *Hyphinoe subfusca* Fowler): Volcán de Chiriquí. *Hyphinoe subfusca* Fowler listed as synonym of *Hyphinoe tau* Fowler by Funkhouser 1927f: 146 and *Hyphinoe tau* Fowler as a synonym of *Hyphinoe obliqua* (Walker) by McKamey 1998: 158

Hyphinoe vulpecula Fowler, 1895:

Chiriquí: (Fowler 1895b: 77): Volcán de Chiriquí; Veraguas: 2 km. NW Santa Fe (1♀: DJFC)

Tomogonia vittatipennis (Fairmaire, 1846)*:

Colon: Barro Colorado Island, 3 km. SW Gatun, Pipeline Rd.; Panama: near Rodman (4♀♀: DJFC, HWIC)

Tribe Procyrtini Deitz, 1975

Procyrtia pectoralis (Fabricius, 1803):

Chiriquí: Fortuna; Cocle: El Cope; Colon: Barro Colorado Island, Quebrada Lopez, Pipeline Rd.; Panama: Las Cumbres, Interamerican Hwy: 3 km. E. Ipeti, Camino del Oleoducto (19♀♀/10♂♂: DJFC, STRI, HWIC, UDCC, UGCA, MIUP)

Endoiastinae Deitz & Dietrich, 1993

Endoiastini Deitz & Dietrich, 1993

Endoiastus caviceps Fowler, 1896*:

Colon: Barro Colorado Island: Gigante Peninsula; Panama: Lago Alajuela, Cerro Jefe, El Llano-Carti Rd, nr. Gambo Plantation Rd (2♀♀/4♂♂: DJFC, UDCC, MIUP)

Heteronotinae Goding, 1926

Heteronotini Goding, 1926

Anchistrotus obfuscatus (Buckton, 1903)*:

Colon: Gatun; Panama: Las Cumbres, Bayano River Bridge (1♀/3♂♂/1 unknown sex: HWIC)

Darnoides brunneus (Germar, 1835):

Chiriquí: (Goding 1929e: 226): David

Heteronotus glandiferus (Lesson, 1832): (Buckton 1903a: 141 as *Heteronotus vulnerans* (Germar)): Country (Panama) only

Heteronotus reticulatus (Burmeister, 1833): (Goding 1929e: 249): Country (Panama) only

Heteronotus spinosus Laporte, 1832*:

Colon: Barro Colorado Island (2♀♀: HWIC, MIUP)

Heteronotus trinodosus Butler, 1878:

Bocas del Toro: Miramar; Chiriquí: Fortuna; Cocle: El Valle, Farallón; Colon: Barro Colorado Island, Rio Guanche; Darien: Cana, P. N. Darien: Pirre Est. Rancho Frio, Playa Guayabo-bosque S. de Jaque; Panama: El Llano-Carti Rd; Las Cumbres, Campus Univ. de Panama, Quebrada Lopez nr. Sabanitis (8♀♀/14♂♂: DJFC, HWIC, UDCC, MIUP)

Nassunia bipunctata (Fairmaire, 1846):

Colon: Barro Colorado Island, Pipeline Rd, 4 km. E. Margarita; Panama: Panama City, Gamboa (19♀♀/4♂♂: STRI, HWIC, UDCC)

Nassunia dalmani Stål, 1862*:

Panama: Cerro Campana, Parque Metropolitano (2♀♀/1♂: DJFC, DMWC)

Nassunia trux Breddin, 1901*:

Chiriquí: Fortuna; Panama: Cerro Campana (2♀♀/1♂: DMWC, HWIC)

Rhexia semiatra (Fairmaire, 1846): Chiriquí: Hornito, (Fowler 1895c:83 as *Scaphula melanocephala* Fowler): Bugaba (1♀: DJFC)

Rhexia viridicollis (Fowler, 1895):

Chiriquí: Bugaba (Fowler 1895e: 118 as *Microtalis viridicollis* Fowler)

Darien: P. N. Darien Pirre (1 sex unknown: HWIC)

Smiliorachis variegata Fairmaire, 1846*:

Colon: Pipeline Rd (2♀♀/2♂♂: HWIC)

Membracinae Rafinesque, 1815

Hoplophorionini Goding, 1926

Alchisme apicalis (Walker, 1851):

Chiriquí: nr. Volcán along shore of Laguna de Volcán; Bugaba, (Fowler 1894c:33); Panama: 0.3 km W El Llano (11 ♀♀/10 ♂♂, 1 sex unknown: DJFC, UDCC, UGCA).

Alchisme grossa (Fairmaire, 1846): Chiriquí: Candela Renacimiento (1 ♀: MIUP).

Alchisme turruta (Germar, 1835):

Alchisme turruta is recorded from Country (Panama) only in Goding 1929e: 207 as *A. veruta*, Country (Panama) only in Metcalf & Wade 1965a: 562–563 as *A. veruta*, and Country (Panama) only in McKamey & Deitz 1996a: 313 who reinstates *A. veruta* as valid species apart from *A. turruta*. Goding 1929e: 207 synonymized *Alchisme turruta* (Germar) with *Alchisme veruta* Fowler, citing Fowler's Panama distribution for *A. veruta*.

Alchisme turruta (Germar) distribution, according to McKamey 1998:178 is Argentina, Brazil, Ecuador, and Peru therefore *Alchisme turruta* recording in Panama is an error.

Alchisme veruta (Fowler, 1894): (Fowler 1894c: 33 as *Triquetra veruta* Fowler). Country (Panama) only (Fowler 1894c: 34).

Alchisme virescens (Fairmaire, 1846):

Chiriquí: 1 km. N Boquete; 3 km. W Cerro Punta; 15 km. NW Volcán; nr. Volcán along shore of Lagunas de Volcán (7 ♀♀/3 ♂♂: DJFC, UDCC).

Metcalfiella costaricensis McKamey, 1991*:

Chiriquí: Palmira arriba-Boquete; Veraguas: 2 km. NW Santa Fe (2 ♀♀: MIUP, DJFC)

Metcalfiella monogramma (Germar, 1835):

Chiriquí: Boquete (McKamey 1991c: 55)

Potnia brevicornis (Fairmaire, 1846):

Chiriquí: nr. Volcán along the shore of Lagunas de Volcán, nr. Bambito along Bambito Volcán Barú; Colon: Canal Zone-Pipeline Road (6 ♀♀/6 ♂♂: UDCC, DJFC)

Potnia dubia (Fowler, 1894):

Chiriquí: Volcán de Chiriquí (Fowler 1894c: 45 as *Ochropepla dubia* Fowler).

Potnia gladiator (Walker, 1851):

Chiriquí: nr. Chiriquí; Colon: Barro Colorado Island; Panama: Cerro Galera, Gamboa Plantation (5 ♀♀/5 ♂♂: DJFC, HWIC, UDCC)

Potnia granadensis (Fairmaire, 1846):

Chiriquí: Bugaba, Volcán de Chiriquí, Boquete. Caldera and David (Fowler 1894c: 46 as *Potnia brevicornis* Fowler), Las Lagunas-Volcán, nr. Bambito along Bambito Volcán Barú; nr. Volcán along the shore of Lagunas de Volcán, Colon: Barro Colorado Island, (7 ♀♀/1 ♂: DJFC, UDCC, MIUP)

Umbonia amazili Fairmaire, 1846: Country (Panama) only (Goding 1929e: 205)

Umbonia ataliba Fairmaire, 1846:

Chiriquí: nr. Volcán along shore of Lagunás de Volcán (1 ♀: UDCC)

Umbonia crassicornis (Amyot & Serville, 1843):

Bocas del Toro: El Guabo, Punta Peña; Chiriquí: Gualaca between Gualaca and Los Planes; Cocle: Rio Grande; Darien: P. N. Darien Cruce de Mono; Panama: Vera Cruz, Campus Universidad de Panama, Arraijan (17 ♀♀/16 ♂♂: STRI, UDCC, MIUP)

Umbonia spinosa (Fabricius, 1775):

Panama: Gamboa, Cerro Campana, Fort Kobbe; Veraguas: 10 km. N Santiago (22 ♀♀/3 ♂♂: DJFC, STRI, UDCC).

Hoplophorioni Incertae sedis

Ochropepla corrosa (Fairmaire, 1846):

Bocas del Toro: Chiriquí Grande (1 ♂: DJFC)

Ochropepla inaequalis Fowler, 1894:

Chiriquí: Fortuna Dam (1♀: NCSU), Volcán de Chiriquí (Fowler 1894c: 44)

Hoplophora concinna Fowler, 1894:

Chiriquí: Volcán de Chiriquí (Fowler 1894c: 41)

Aconophorini Goding, 1892

Aconophora compressa Walker, 1851*:

Chiriquí: Las Lagunas 4 km W. Hato del Volcán; Rio Serano Rd, Mina Cerro, Colorado; Boquete, Rio Colorado (6♀♀: DJFC, STRI, HWIC); Rio Chiriquí (Dietrich & Deitz, 1991a: 115), 2 km N El Volcán (Dietrich & Deitz, 1991a: 115); Herrera: Viejo (Dietrich & Deitz, 1991a: 115)

Aconophora flavipes (Germar, 1835)*:

Chiriquí: 2 km W Cerro Punta (1♀: DJFC).

Aconophora laminata Fairmaire, 1846:

Chiriquí: Fortuna Dam area Ridge Trail N of N. Fork Quebrada Arena (Dietrich & Deitz, 1991a: 119), Galera de Chorchá, Las Lagunas 4 km W. Hato del Volcán, 15 km NW Volcán, N. Santa Clara, 3 km. W Cerro Punta; Veraguas: 2 km NW Santa Fe (7♀♀, 2♂♂: DJFC, NCSU, STRI)

Aconophora marginata Walker, 1851:

Chiriquí: Volcán de Chiriquí (Fowler 1895a: 65)

Aconophora mexicana Stål, 1864:

Chiriquí: Volcán de Chiriquí (Fowler 1895a: 62), El Valle de Nubes 12 mi (19.2 km) NW Rovira (Dietrich & Deitz 1991a: 102); Darien: 10 km. S. El Real Rio Pirre and Rancho Fria Trail Cerro Campana (454m) (Dietrich & Deitz 1991: 102); Panama: Canal Zone: Farfan Beach (Dietrich & Deitz 1991: 102)

Aconophora robusta Dietrich, 1991:

Chiriquí: Boquete (Dietrich & Deitz 1991a: 122), Potrerillos (3♀♀/1♂: NCSU)

Calloconophora caliginosa (Walker, 1858)*:

Panama: El Llano-Carti Road (1♂: DJFC)

Calloconophora obliqua Dietrich, 1991:

Darien: Santa Fe (Dietrich and Deitz 1991a: 76)

Calloconophora obtusa (Walker, 1851)*:

Bocas del Toro: 9 km. S. Punta de Peña, Chiriquí Grande; Darien: Cana River Trail, Camp Pirre Trail; Panama: Cerro Campana, Parque Metropolitano; Veraguas: Alto de Piedra above Santa Fe (8♀♀: DJFC, DMWC)

Calloconophora pinguis (Fowler, 1895):

Darien: Cana (3♀♀: DJFC), (Dietrich & Deitz 1991a: 92): 10 km. S. El Real, Rancho Fría; Bocas del Toro: (Dietrich & Deitz 1991a: 92): Chiriquí Grande & Changuinola; Chiriquí: (Dietrich & Deitz 1991a: 92): Bugaba, Volcán de Chiriquí, Blue Mountain; Colon (Dietrich & Deitz 1991a: 92): Barro Colorado Is, Cocoli, Summit, Gatun, Pedregal

Calloconophora pugionata (Germar, 1821):

Chiriquí: Bugaba (Goding 1929e: 230 synonymized with *Aconophora nitida* Fowler)

Guayaquila attenuata Dietrich, 1991:

Colon: Gatun (Dietrich and Deitz 1991a: 62)

Guayaquila contorta Dietrich, 1991:

Chiriquí: (Dietrich & Deitz 1991a: 36): Volcán Barú, El Valle de Nubes, 22.4 km. NW Rovira

Guayaquila fasciata Dietrich, 1991:

Colon: Pipeline Road, 3 km. NW Gamboa (2♂♂: DJFC); (Dietrich and Deitz 1991a: 60): Barro Colorado Island, Fort Gulick

Guayaquila fusiformis (Fowler, 1895):

Bocas del Toro: Isla Colon; Chiriquí: Las Nubes, 5 km. E. Chiriquícito (Dietrich & Deitz 1991a: 52): Volcán de Chiriquí; Veraguas: Alto de Piedra above Santa Fe (2♀♀/3♂♂: DJFC)

Guayaquila gracilicornis (Stål, 1869):

Bocas del Toro: Chiriquí Grande, Isla Colon; Chiriquí: Fortuna, P. N. Volcán Barú, (Dietrich and Deitz 1991a: 54): Bugaba, Rovira, Volcán de Chiriquí, between Gorgona and Monte Lirji; Cocle: El Valle, 5 km. N. El Cope, (Dietrich and Deitz 1991a: 54): Agua Dulce, Las Sabaras, Nuevo Limón; Colon: Canal Zone: Pipeline Rd 7 mi. NW Gamboa, Santa Rita, Barro Colorado Island, Gatun, 13.5 km. NE Sabanita; Darien: Cana Locomotive Trail; Panama: Panama City: La Cresta, Panama City: San Miguelito Los Andes, Panama City: La Alameda, Universidad of Panama, Canal Zone: Ancon, Canal Zone: Farfan Beach, Altos de Campaña, Cerro Campana, Canal Zone: Fort Kobbe, Canal Zone: Curundu, Arroiñan, Las Cumbres, El Llano- Carti Rd, Capira: Ligice, Cerro Batea, Bosque de Tumbo Muetto, Lago Alajuela, Bayano: 18.4 km. W Ipeti, El Llano, (Dietrich and Deitz 1991a: 54): La Cresta, “El Cermeno”, Balboa, Summitt, Puma; Veraguas: Alto de Tiedra above Santa Fe; (75♀/30♂♂: DJFC, NCSU, STRI, HWIC, UGCA, MIUP)

***Guayaquila pallescens* (Stål, 1869):**

Chiriquí: (Dietrich and Deitz 1991a: 24): Las Lagunas nr. El Hato; Colon: Achiote Rd, Gatun; Darien: (Dietrich and Deitz 1991a: 24): 10 km. S. El Real, Rio Pirre; Herrera: El Limón; Panama: nr. Rodman, Cerro Campana; (9♀/5♂♂: DMWC, HWIC)

***Guayaquila roreriana* Goding, 1921:**

Colon: Santa Rita: Ridge Rd. (1♀: DJFC)

Hypsoprini Haupt, 1929

***Cladonota (Falculifera) apicalis* (Stål, 1869):**

Bocas del Toro: Isla Colon, Corriente Grande, Changuinola; Chiriquí: Los Planes, 1 km. SE Fortuna Dam “Blow Area”, Mina Cerro Colorado, Las Lagunas 48 km. W Hato del Volcán, Bambito, Boquete, Finca La Suiza; Cocle: El Valle, El Cope, Altos de Campaña; Colon: 5 km. SW Portobelo, Achiote, 4 km. SW Gatun, Barro Colorado Island; Darien: Rio Tuquesa, Esp. Rancho Frio Pirre P. N. Darien; Herrera: Cerro Alto Higo 15 km. SW Las Minas; Los Santos: Cerro Canajagua; Panama: Cerro Campana, La Laguna 9 km. ENE of El Valle, Las Cumbres, 18 km. SE Impeti along Darien Hwy; Veraguas: Alto de Piedra above Santa Fe, Bahia Honda Rio Limón, Bahia Honda Playa Limón, 2 NE Santa Fe (35♀/18♂♂: DJFC, DMWC, UDCC, UGCA, MIUP, HWIC)

***Cladonota (Falculifera) bolivari* (Peláez, 1945)*:**

Bocas del Toro: Chiriquí Grande, 7-12 km. N Continental Divide, 4 km. S Chiriquí Grande (oil tanks), 5 km. W Chiriquí Grande, Oil Storage Facility Road approx. 5 km. SE Chiriquí Grande; Chiriquí: nr. Candela, Continental Divide Trail; Panama: Cerro Campana (13♀/4♂♂: DJFC, STRI, UDCC, UGCA)

***Cladonota (Falculifera) zeledoni* (Peláez, 1967)*:**

Bocas del Toro: 7-12 km. N Continental Divide, Chiriquí Grande, 5 km. W Chiriquí Grande (1♀/10♂♂: DJFC, UDCC)

***Cladonota (Lobocladisca) biclavata* (Westwood, 1840):**

Cocle: Anton; Colon: Barro Colorado Island, Fort Davis Atl.; Panama: Las Cumbres, Fort Kobbe (Canal Zone) (6♀/10♂♂: STRI, HWIC, UGCA, MIUP)

***Cladonota (Lecythifera) inflata* (Fowler, 1894): Country (Panama) only (Haupt 1953a: 35)**

***Cladonota (Lecythifera) robustula* (Fowler, 1894): Country (Panama) only (Peláez 1945a: 64)**

***Hypsoprora adusta* Creão-Duarte & Sakakibara, 2004*:**

Panama: Ilano-Carti Road km. 8-10 (1♀: STRI)

***Hypsoprora anatina* Fowler, 1894:**

Canal Zone: Pipeline Road; Cocle: El Valle; Chiriquí: (Fowler 1894c: 26): Bugaba, Volcán de Chiriquí (1♀/2♂♂: HWIC)

***Hypsoprora coronata* (Fabricius, 1803):**

Colon: Barro Colorado Island; Darien: Cana (Airstrip) (2♀/3♂♂: DJFC, HWIC)

***Hypsoprora trituberculata* (Stål, 1869):**

Chiriquí: (Fowler 1894c: 25): Bugaba

***Notocera bituberculata* (Fowler, 1894):**

Bocas del Toro: Corriente Grande, Chiriquí: Potrerillos, Los Planes, Alanje, (Fowler 1894b: 24): Bugaba, Vol-

cán de Chiriquí Caldera, David, San Lorenzo; Cocle: El Valle, Rio Santa Maria, Altos de Campaña; Colon: Barro Colorado Island, Pipeline Road, Zona del Canal Fort Sherman, Gigante Peninsula, Piña Road, Fort Gulick (Canal Zone); Darien: Cruce de Mono P. N. Darien, 8.5 km. S El Real; Los Santos: (Fowler 1894b: 24): Peña Blanca; Panama: Altos de Majé Chepo, Cerro Azul, Cerro Campana, Zona del Canal Fort Kobbe, Cerro Galera, Curundu (Canal Zone – Contractors Area), Las Cumbres, Brisas del Mar Vera Cruz, Parq. Metropolitano, Arraijan, Gamboa nr. Plantation Road; Veraguas: Alto de Piedra above Santa Fe (43♀/28♂♂: DJFC, DMWC, NCSU, STRI, STRI-W, UDCC, UGCA, MIUP)

Notocera brachycera (Fairmaire, 1846)*:

Bocas del Toro: 3 km. W Fortuna Hwy at Continental Divide; Darien: P. N. Darien Pirre Esp. Rancho Frio; Panama: Cerro Campana, Cerro Campana Road, Isla Taboga (4♀/2♂♂: DJFC, DMWC, HWIC, UGCA, MIUP)

Notocera cerviceps (Fowler, 1894):

Bocas del Toro: Chiriquí Grande; Chiriquí: (Fowler 1894b: 24 as *Pterygia cerviceps* Fowler): Bugaba Caldera; Cocle: Altos de Campaña; Colon: Pipeline Road, Limbo (Hunt Club) north of Gamboa; Panama: Camino del Oleoducto; San Blas: Nusagrande [Lodge]; (7♀/2♂♂: DJFC, STRI, HWIC, UGCA)

Notocera dispar Strümpel, 1972*:

Chiriquí: 7 km. W Chiriquícito (1♂: UGCA)

Notocera satanus (Lesson, 1832)*:

Chiriquí: Fortuna—Boquete Road nr. Caldera; Herrera: 6 km. SW of Paris; Panama: Cerro Galera, Lago Alajuela, Madden Forest (2♀/4♂♂: UDCC, MIUP, STRI)

Notocera spinidorsa Goding, 1929*:

Bocas del Toro: Rio Changuinola; Colon: Pipeline Road 10 mi. NW Gamboa; Darien: Cana (2♀, 1♂: STRI, HWIC)

Notocera tuberosa (Fairmaire, 1846)*:

Chiriquí: Potrerillos (1♀: NCSU)

Philya ascendens (Walker, 1851)*:

Chiriquí: 2 km. W Caldera (1♀: DMWC)

Membracini Rafinesque, 1815

Bolbonota (Bolbonota) aurosericea Stål, 1862*:

Colon: Barro Colorado Island (2♀♀: HWIC)

Bolbonota (Bolbonota) cuneata Fowler, 1894:

Bocas del Toro: Chiriquí Grande; Chiriquí: (Fowler 1894b: 17): Bugaba, Volcán de Chiriquí; Panama: El Llano-Carti Road km 8 (1♀, 8♂♂: DJFC, UDCC)

Bolbonota (Bolbonota) globosa Fairmaire, 1846*:

Chiriquí: Potrerillos; Colon: Barro Colorado Island (3♀♀, 4♂♂: NCSU, STRI)

Bolbonota (Tubercunota) bituberculata Stål, 1862*:

Bocas del Toro: 2 km. S. Punta de Peña, 9 km. S. Punta de Peña, Chiriquí Grande; Chiriquí: North Santa Clara; Colon: 20 km. NE Portobelo; Panama: Capira Lidice, nr. Gamboa Pipeline Rd (11♀♀, 1♂: DJFC, UDCC, UGCA, MIUP)

Bolbonota (Bolbonota) inconspicua Fowler, 1894*:

Bocas del Toro: Chiriquí Grande, Isla Colon, 7-12 km. N Continental Divide; Chiriquí: Los Planes; Colon: Fort Sherman (Piña Road), Pipeline Road, Barro Colorado Island; Darien: Pirre Station Darien Nat. Park, Cana Mine Trail, Cana River Trail, Cana Boca de Cupe Trail; Panama: Parque Metropolitano, Lago Alajuela metros (altura), Las Cumbres, Cerro Campana, Gamboa Plantation Road (27♀♀, ♂: DJFC, DMWC, HWIC, UDCC, UGCA, MIUP)

Bolbonota (Bolbonota) pictipennis Fairmaire, 1846:

Bocas del Toro: Isla Colon, Chiriquí Grande; Chiriquí: Fortuna, Los Planes, 6 km. S. Los Planes; Cocle: La Mesa above El Valle; Colon: Barro Colorado Island, Pipeline Road, Quebrada Lopez, Santa Rita Ridge Road

(12 km. ESE Colon); Darien: 8.5 km. S. El Real; Panama: El Llano-Carti Road km. 8 & 9, Parque Metropolitano, Cerro Campana, Las Cumbres, Fort Clayton (Canal Zone), Cerro Azul, Lego Alajuela metro (altura), Pipeline Road km. 10.5; Veraguas: Alto de Pidra above Santa Fe (37♀♀, 3♂♂: DJFC, DMWC, HWIC, MIUP)

Bolbonota (Bolbonota) pusilla Fairmaire, 1846*:

Chiriquí: Potrerillos (1 sex unknown: NCSU)

Bolbonota (Tubercunota) corrugata Fowler, 1894:

Bocas del Toro: Isla Colon, Chiriquí Grande; Chiriquí: Boquete, Rio Colorado; Cocle: 5 km. N El Cope; Colon: Barro Colorado Island, Fort Sherman Piña Road, 4 km. SW Gatun, 5 km. SW Portobelo, Isla Galeta Road, Santa Rita Ridge Road, Pipeline Road, Coco Solo Hospital (Canal Zone), Chagres Bridge, 20 km. NE Portobelo, Achiotte, Fort San Lorenzo; Darien: Cana, 8.5 km. S El Real, Cana River Trail, Cana Boca de Cupe Trail, Cana Mine Trail; Panama: Fort Kobbe, Cerro Galera (Canal Zone), Arraijan, Cerro Campana, Curundu (Canal Zone), Venado Beach N of Arraijan, El Llano-Carti Road, Las Cumbres, 7 km. SE Gamboa, 9 km. E Chepo, San Mgt. Los Andes, 3 km. S Torti Cerro Sin Nombre, Bayano 18.4 km. W Ipeti, Gamboa, Lago Alajuela metros (altura), Pipeline Road, (Fowler 1894b: 19): Taboga Island, San Miguel in Pearl Island (116♀♀, 16♂♂: DJFC, STRI, HWIC, UDCC, UGCA, MIUP)

Bolbonota (Tubercunota) inaequalis (Fabricius, 1803):

Bocas del Toro: Corriente Grande, 5 km. W Chiriquí Grande; Colon: Pipeline Road, Barro Colorado Island, Piña Road; Darien: Cana River Trail; Panama: Fort Kobbe (Canal Zone), Los Cumbres, Madden Forest, Panama City San Miguelito Los Andes, Pipeline Road nr. Gamboa 13-20 km, San Blas: 2.5 km. S Campamento Nusaghandi (5♀♀, 26♂♂: DJFC, HWIC, UDCC, MIUP)

Bolbonota (Tubercunota) insignis Fowler, 1894:

Bocas del Toro: Miramar; Chiriquí: (Fowler 1894b: 17): Bugaba, Volcán de Chiriquí; Darien: 8.5 km. S El Real, Cana Air Strip (4♀♀: DJFC, HWIC, MIUP)

Bolbonota (Bolbonota) rufonotata Fowler, 1894*:

Colon: Pipeline Road; Barro Colorado Island (2♂♂: HWIC)

Campylenchia hastata (Fabricius, 1787):

Bocas del Toro: Corriente Grande; Chiriquí: Cerro Punta, 6 km. S Los Planes; Canal Zone: Pipeline Road; Cocle: Alto de Campaña; Colon: Isla Galeta Road, Quebrada Lopez, Achiotte, Barro Colorado Island, Rio Guanche; Panama: Fort Kobbe (Canal Zone), Cerro Campana, Arraijan, Pedro Miguel Paraiso, Ciudad Panama La Alameda, Capira Lidice, El Cangrejo Panama City, Cerro Azul, Cerro Batea, 3 km. SW Torti, 5.7 km. E El Llano, El Llano-Carti Road, Pipeline Road; Veraguas: Coiba Isla, 2.1-4.5 km. S Santa Fe, 9 km. S Santa Fe (43♀♀, 10♂♂: DJFC, HWIC, UDCC, UGCA, MIUP)

Enchenopa albidorsa (Fairmaire, 1846)*:

Darien: P. N. Darien Pirre Est. Rancho Frio, 10 mi. S de El Real, Villa Darien; Panama: Cerro Campana (4♀♀: DJFC, MIUP)

Enchenopa ansera Funkhouser, 1943*:

Chiriquí: Rio Colorado; Canal Zone: Pipeline Road; Colon: Barro Colorado Island; Panama: Las Cumbres, Arraijan (9♀♀, 1♂: HWIC)

Enchenopa bifusifera Walker, 1858*:

Chiriquí: Rio Colorado; Colon: Barro Colorado Island; Panama: Cerro Campana, Las Cumbres (3♀♀, 3♂♂: NCSU, HWIC)

Enchenopa binotata (Say, 1824):

Chiriquí: Portrerillos (Arriba); Panama: Cerro Campana (4♀♀, 1♂: DJFC, NCSU)

Enchenopa gladius (Fabricius, 1803):

Chiriquí: (Fowler 1894b: 11): Bugaba

Enchenopa ignidorsum Walker, 1858:

Chiriquí: Rio Colorado, 6 km. S Los Planes, Los Planes; Canal Zone: Pipeline Road; Colon: Barro Colorado Island; Darien: Cana Locomotive Trail, Cana Mine Trail, Cana River Trail, Cana Station; Panama: Fortuna (17♀♀, 5♂♂: DJFC, HWIC)

Enchenopa monoceros (Germar, 1821)*:

Chiriquí: Fortuna; Panama: Los Cumbres (6♀♀, 4♂♂: HWIC)

Enchenopa multicarinata Fowler, 1894: Country (Panama) only (Goding 1928e: 210)

Enchenopa sericea Walker, 1851:

Chiriquí: Rio Colorado, Rio Sereno Road, Bambito, Volcán, Volcancitos, Portrerillos, 3 km. W Cerro Punta, 1 km. N Boquete; Colon: Piña Road; Panama: Chagres Bridge (18♀♀, 8♂♂: DJFC, NCSU, HWIC)

Enchenopa squamigera (Linnaeus, 1758)*:

Colon: Barro Colorado Island (7♀♀, 1♂: HWIC)

Enchophyllum dubium Fowler, 1894:

Bocas del Toro: 1 km. below Fortuna on Continental Divide Trail, Corriente Grande, Chiriquí Grande; Chiriquí: Potrerillos, 7 km. NW Hato del Volcán, Fortuna, Reserva la Fortuna on Continental Divide Trail, Continental Divide Trail, near Chiriquícito; Darien: Cana River Trail (19♀♀, 9♂♂: DJFC, NCSU, HWIC, UDCC, UGCA)

Enchophyllum fulica (Germar, 1835):

Darien: P. N. Darien Pirre Est. Rancho Frio (1♀: MIUP)

Enchophyllum lanceolatum (Fabricius, 1787):

Chiriquí: Portrerillos (Fowler 1894b):14: Bugaba, Volcán de Chiriquí; Cocle: Alto de Campaña; Colon: Barro Colorado Island; Panama: Cerro Galera; Veraguas: Parque Nat. Santa Fe (11♀♀, 1♂: NCSU, HWIC, UGCA)

Enchophyllum melaleucum (Walker, 1858)*:

Bocas del Toro: Isla Colon, Miramar; Cocle: El Valle, Colon: Barro Colorado Island, Fuerta Sherman, Parq. Rec. Lago Gatun; Darien: Cana, 1 mi. N Cana Escucha Ruido, Cana Mine Trail; Panama: Cerro Campana, Cerro Galera, El Llano-Carti Road, Arraijan, Cerro Azule Las Nubes, Cerro Jefe, Camino Plantation, Cerro Campana Parque Nacional Altos de Campaña (27♀♀, 5♂♂: DJFC, DMWC, HWIC, UDCC, UGCA, MIUP)

Erechtia abbreviata (Fabricius, 1803):*

Darien: Cana Camp Pirre (1♀, 3♂♂: DJFC)

Erechtia bicolor Walker, 1858*:

Panama: Cerro Galera (1♀: DJFC)

Erechtia gibbosa (DeGeer, 1773)*:

Colon: Pipeline Road (4♀♀: HWIC)

Erechtia sallaei (Fowler, 1894):

Chiriquí: Los Planes, nr. Volcán along shore of Lagunas de Volcán, Portrerillos; Darien: Cruce de Mono P. N. [Darien]; Panama: El Llano-Carti Road (4♀♀, 1♂: DJFC, UDCC, MIUP)

Erechtia torva (Germar, 1835):

Darien: 2 mi. N Cana Escucha Ruido; Panama: Cerro Azul Las Nubes (1♀, 2♂: DJFC, MIUP)

Erechtia uniformis (Fowler, 1894):

Bocas del Toro: Isla Colon, 3 km. W. Bocas del Toro; Chiriquí: Fortuna; Colon: Pipeline Road; Panama: Las Cumbres (2♀♀, 3♂♂: DJFC, STRI-W)

Eunusa concolor Fonesca, 1974*:

Colon: Pipeline Road; Panama: Gamboa (1♀, 2♂♂: DJFC, UDCC)

Leioscyta nitida Fowler, 1894:

Chiriquí: Bugaba, Volcán de Chiriquí (Fowler 1894b:14); Cocle: Altos de Campaña; Colon: Barro Colorado Island Canal Zone; Darien: Cana Mine Trail; Panama: Cerro Campana, Parque Nacional Altos de Campaña, Cerro Galera (31♀♀, 10♂♂: DJFC, STRI, HWIC, UDCC, UGCA, MIUP)

Leioscyta similis Fonesca & Diringshofen, 1969*:

Colon: Piña Road Canal Zone (1 sex unknown: HWIC)

Membracis dorsata Fabricius, 1803:

Bocas del Toro: Chiriquí Grande, Miramar; Colon: Barro Colorado Island Canal Zone; Panama: 6 km. S Ipeti, Las Cumbres (19♀♀, 2♂♂: DJFC, HWIC, MIUP)

Membracis foliata (Linnaeus, 1758)*:

Darien: Cervania del Pirre Rancho Frio (2♂♂: HWIC)

Membracis foliataarcuata (DeGeer, 1773)*:

Colon: 4 km. SW Gatun; Darien: 10 km. S El Real, Pirre Station Darien National Park; Panama: Las Cumbres (5♀♀: DJFC, HWIC, MIUP)

Membracis mexicana Guérin-Ménéville, 1844:

Bocas del Toro: Chiriquí Grande; Chiriquí: Dst. Renacimiento Santa Clara, Galerade Chorchá, Boquete, Route 1 Carretera Interamericana nr. Tolé; Cocle: Penonomé; Colon: Barro Colorado Island; Darien: Camp Pirre; Panama: Rio Caimito Chorrera, Tumbo Muerto, Tocumen; Veraguas: 20 km. S Santa Fe Rio Sta. Maria (9♀♀, 9♂♂: DJFC, NCSU, STRI, HWIC, UDCC, MIUP)

Membracis peruviana Fairmaire, 1846*:

Bocas del Toro: Miramar (1♀, 1♂: HWIC)

Membracis trimaculata Fairmaire, 1846*:

Cocle: El Copé; Colon: Fort Sherman Mojinga Swamp, 9 km. E Chepo Road; Darien: Cana Parque Nacional Darien; Panama: Cerro Campana Capira (7♀♀, 2♂♂: DJFC, NCSU, HWIC, MIUP)

Tylopelta gibbera (Stål, 1869):

Bocas del Toro: Oil Storage Facility Road approx. 5 km. SE of Chiriquí Grande; Chiriquí: Potrerillos, San Lorenzo, Boquete, Fortuna-Caldera-Boquete Road, Fortuna-Boquete Road: 22 km. from junction with David Fortuna Road; Panama: Cerro Compañá (24♀♀, 5♂♂: NCSU, HWIC, UDCC)

Membracini Incertae sedis

Leioscyta ferruginea Funkhouser, 1922*:

Chiriquí: La Fortuna Continental Divide Trail (2♀♀: DJFC)

Talipedini Deitz, 1975

Trinarea carinata (Funkhouser, 1922)*:

Chiriquí: North Santa Clara; Colon: Barro Colorado Island Canal Zone (2♂♂: DJFC, UGCA)

Nicomiinae Haupt, 1929

Nicomiini Haupt, 1929

Nicomia buccina Albertson, 2005**:

Panama: Province only (Albertson and Dietrich 2005: 248)

Nicomia nigrifasciata Albertson, 2005**:

San Blas: Province only (Albertson and Dietrich 2005:254)

Tolaniini Haupt, 1929

Tolania alida Albertson, 2006**:

Panama: Province only (Albertson and Dietrich 2006: 938); Darien: Cana (1♂: DJFC)

Tolania alvira Albertson, 2006**:

San Blas: Province only (Albertson and Dietrich 2006: 953); Darien: Cana (1♂: DJFC)

Tolania curvata Albertson, 2006**

Chiriquí: Fortuna (1♀, HWIC)

Tolania femoralis Stål, 1862*:

Colon: Quebrada Lopez, Barro Colorado Island Canal Zone, Fort San Lorenzo; Panama: Camino del Oleoducto (4♀♀, 1♂: DJFC, UGCA)

Tolania fraterna Stål, 1862:

Chiriquí: Boquete (1♀: HWIC). Questionable citation for Panama. Goding (1927a:191), Funkhouser (1927f:494), and Metcalf & Wade (1965a:1518) all synonymized *Tolania fraterna* Stål with *Tolania obtusa* Fowler, giving *T. obtusa*'s Panama distribution for *T. fraterna* Stål. Albertson and Dietrich (2006:933) give Brazil as the only distribution for *T. fraterna* and reinstate *T. obtusa* Fowler as a valid species. Specimen identified by the author from HWIC was identified prior to Albertson and Dietrich's 2006 revision, using only key

at the time from Goding 1927a. Specimen will be re-examined at a future date to validate identification as either *T. fraterna* or *T. obtusa*.

Tolania grallator Albertson, 2006**

Chiriquí: Fortuna (1♂: HWIC)

Tolania hispida Albertson, 2006**:

(Albertson and Dietrich 2006: 939): Province only: Bocas del Toro, Chiriquí, Cocle, Panama

Tolania jocosa Albertson, 2006**:

Panama: Cerro Campana (Albertson and Dietrich 2006: 943)

Tolania mckameyi Albertson, 2006**:

Chiriquí: Fortuna (2♂♂: HWIC); Cocle: Province only (Albertson and Dietrich 2006:945): Darien, Panama

Tolania obtusa Fowler, 1896**:

Province only (Albertson and Dietrich 2006:950): Chiriquí, Colon, Darien, Panama, Veraguas

Tolania opponens (Walker, 1858):

Bocas del Toro: Miramar, Corriente Grande; Chiriquí: Fortuna; Colon: Pipeline Road, Barro Colorado Island;

Panama: Cerro Campana, Las Cumbres, Cerro Galera, El Llano-Carti Road (22♀♀, 7♂♂: HWIC)

Tolania periculosa Albertson, 2006**:

Province only (Albertson and Dietrich 2006:939): Bocas del Toro, Chiriquí, Cocle, Colon, Darien, Herrera, Panama

Tolania semipellucida Stål, 1859 **:

Darien: Province only (Albertson and Dietrich 2006:978)

Tolania tumida Albertson, 2006**:

Chiriquí: Province only (Albertson and Dietrich 2006:962); Darien: Cana Camp Pirre (1♂: DJFC)

Smillinae Stål

Acutalini Fowler, 1895

Acutalis fusconervosa Fairmaire, 1846:

Chiriquí: Potrerillos, Los Planes, Concepcion, Los Anastacios, (Fowler 1895e:114: Bugaba, Volcán de Chiriquí, David); Cocle: El Valle de Cocle, Altos de Campaña; Colon: Pipeline Road; Herrera: Cerro Alto Higo 15 km. SW Las Minas; Panama: Las Cumbres, Cerro Campana, Lago Alajuela metros altura (16♀♀, 18♂♂: DJFC, NCSU, STRI, HWIC, UGCA, MIUP)

Thrasymedes pallescens (Stål, 1869)*:

Chiriquí: Volcán, Volcancitos, Bambito (6♀♀, 1♂: HWIC)

Thrasymedes variata (Fowler, 1895):

Chiriquí: Province only (Funkhouser 1927f:232 as *Thrasymedes dubia* Funkhouser)

Amastrini Goding, 1926

Amastris affinis Broomfield, 1976:

Bocas del Toro: Miramar (1♂: HWIC); Colon: Holotype locality: Canal Zone Mojinga Swamp (HOLOTYPE 1♂: Broomfield 1976a:397)

Amastris angulata Broomfield, 1976*:

Canal Zone: Pipeline Road; Colon: Barro Colorado Is, Quebrada Lopez, Panama: Puma Island, Las Cumbres (8♀♀, 31♂♂: DJFC, STRI, HWIC, MIUP)

Amastris antica (Germar, 1821): Broomfield 1976a: 421 Nomen dubium. Goding 1929e: 265 synonymized

Amastris antica (Germar) with *Amastris obtegens* (Fabricius), citing *Amastris obtegens* Panama distribution

Amastris concolor Broomfield, 1976*:

Colon: Barro Colorado Island (1♀, 1♂: STRI)

Amastris froeschneri Broomfield, 1976:

Colon: Type locality: Barro Colorado Island (HOLOTYPE 1♂; PARATYPES 1♂, 2♀♀: Broomfield

1976a:385)

Amastris inornata Broomfield, 1976*:

Colon: R. Guanche (1♂: STRI)

Amastris maculata Funkhouser, 1922:

Colon: Paratype locality: Mojinga Swamp Canal Zone (PARATYPES 2♂♂: Broomfield 1976a: 399 as *A. pseudomaculata* Broomfield); Panama: Holotype locality: Rio Las Lajas nr Coronado Beach (HOLOTYPE: 1♂: Broomfield 1976a: 399)

Amastris obtegens (Fabricius, 1806):

Chiriquí: Caldera in Chiriquí (Fowler 1895d: 92). Goding 1929e: 265 makes *A. obtegens* a junior synonym of *A. flavifolia* Stoll, 1788.

Amastris panamensis Broomfield, 1976:

Panama: Holotype locality: Pacora (HOLOTYPE 1♀: Broomfield 1976a:411)

Amastris specialis Broomfield, 1976*:

Chiriquí: Los Planes; Colon: Quebrada Lopez; San Blas: Nusagandi (3♂♂: DJFC)

Amastris subangulata Broomfield, 1976*:

Colon: Quebrada Lopez, Barro Colorado Island Canal Zone; Panama: Las Cumbres (4♂♂: DJFC, HWIC)

Amastris undulata Broomfield, 1976*:

Colon: Quebrada Lopez, Fort Sherman (2♂♂: DJFC)

Harmonides dispar (Fabricius, 1803)*:

Colon: Pipeline Road, Barro Colorado Island Canal Zone; Panama: Lago Alajuela metros (altura), El Llano-Carti Road, Camino del Oleoducto (18♀♀, 17♂♂: STRI, HWIC, UDCC, UGCA, MIUP)

Harmonides panamensis Creão-Duarte and Sakakibara, 2000**:

Colon: Barro Colorado Island Canal Zone; Darien: Cana Airstrip; Panama: El Llano-Carti Road, Howard AFB (Creão-Duarte and Sakakibara 2000:311):Panama-Canal Zone/Pipeline Road (2♀♀, 1♂, 1♂ (no abdomen): DJFC, UGCA)

Harmonides reticulata (Fabricius, 1803):

Canal Zone: Pipeline Road; Cocle: El Valle; Colon: Parque Lago Gatun, Barro Colorado Island, Pipeline Road, Limbo Hunt Club north of Gamboa, Piña Road, Quebrada Lopez (12 km. W Colon), Santa Rita Ridge Road; Darien: Cana River Trail, Cana Station; Panama: Anton, El Llano-Carti Road km. 8, Las Cumbres, Tumbo Muerto, Parque metropolitano, P. N. Soberania Camino Plantacion, Alajuela, Lago Alajuela metro (altura), Cerro Galera Canal Zone (56♀♀, 52♂♂: DJFC, DMWC, STRI, HWIC, UGCA, MIUP)

Idioderma virescens Van Duzee, 1909*:

Colon: Barro Colorado Island Canal Zone; Panama: Maje Bayano River (1♀, 1♂: UDCC, HWIC)

Lallemandia nodosa Funkhouser, 1922*:

Colon: Quebrada Lopez, Barro Colorado Island; Panama: Las Cumbres, Perlas Isla San Jose (3♀♀, 6♂♂: DJFC, USNM)

Neotynelia pubescens (Fabricius, 1803)*: (formerly in *Tynelia*)

Bocas del Toro: Corriente Grande, Miramar; Colon: Barro Colorado Island, Pipeline Road; Panama: El Llano-Carti Road km. 8, Las Cumbres, Camino del Oleoducto (16♀♀, 14♂♂: DJFC, STRI, HWIC, UDCC, UGCA)

Neotynelia vertebralis (Fairmaire, 1846)*: (formerly in *Tynelia*)

Colon: Barro Colorado Island Canal Zone, Fort Sherman (1♀, 1♂: DJFC, UDCC)

Tynelia longula (Burmeister, 1835)*:

Colon: Barro Colorado Island; Panama: Las Cumbres (4♀♀: HWIC)

Vanduzee albifrons (Fowler, 1895)*:

Bocas del Toro: Miramar (1♂: HWIC)

Vanduzee decorata Funkhouser, 1940: Country (Panama) only (McKamey 1998: 239)

Vanduzee mayana Funkhouser, 1943*:

Darien: 8.5 km S El Real; Panama: Arraijan, Lago Alajuela; Las Cumbres (6♀♀, 9♂♂: MIUP)

Vanduzee segmentata (Fowler, 1895):

Chiriquí: Potrerillos, North Santa Clara, 15 km NW Volcán, Hartmann's Finca, Los Planes, (Fowler 1895d:93): Volcán de Chiriquí; Cocle: Penonomé; Colon: Barro Colorado Island; Panama: Las Cumbres, Maje Bayano River, Ancon (Tivoli Bldg.), Ciudad Panama (La Alameda), Paraiso-Pedro Miguel, Ciudad Panama (Bella Vista),

Ceresini Goding, 1892

Antonae ciliata (Fairmaire, 1846):

Darien: Cerro Pirre (1♀: HWIC)

Ilithuca elegans (Fowler, 1895):

Chiriquí: Volcán de Chiriquí (Fowler 1895d: 107 as *Centrogonia elegans* Fowler)

Ceresa cuprea Funkhouser, 1927:

Bocas del Toro: Guabito (Goding 1928d: 137)

Ceresa vitulus (Fabricius, 1775):

Chiriquí: Volcán de Chiriquí (Fowler 1895d: 102)

Cyphonia clavata (Fabricius, 1787):

Bocas del Toro: Almirante, Chiriquí Grande; Chiriquí: Potrerillos, Vagala 10 km NW David, Alante; Cocle: La Mesa above El Valle Cerro Caracoral, El Valle, Valle de Antón; Colon: Barro Colorado Is, Santa Rita Ridge Road 12 km ESE Colon, Lago Alajuela (metros altura); Darien: 8.5 km S El Real, Cerro Pirre (Est. Inrendre), Cana (River Trail), Cana (Airstrip), 2 mi N Cana Escucha Ruido; Panamá: Cerro Campana, El Llano-Carti Road km 9, Canal Zone Cerro Galera, Isla Saboga (Perlas Island), Las Cumbres, El Llano-Carti Road km 13.6, Campus Universitario U.P., Cerro Azul Camino (alrededor del lago), Tumba Muerto, Gamboa (hw mile 13.2); Veraguas: Cerro Tute 4 km W Santa Fe (33♀♀, 26♂♂: DJFC, NCSU, STRI, HWIC, UDCC, UGCA, MIUP)

Cyphonia trifida (Fabricius, 1787):

Colon: Barro Colorado Is, Lago Alajuela; Darien: 10 km S El Real, Cana (Airstrip), Camp Pirre Trail; Panamá: Cerro Jefe nr lake (4♀♀, 3♂♂: DJFC, HWIC, MIUP)

Paraceresa bifasciata (Fairmaire, 1846)*:

Darien: Cana River Trail (1 sex unknown: DJFC)

Poppea capricornis Fowler, 1895:

Bocas del Toro: Changuinola, Miramar; Chiriquí: Bugaba (Fowler 1895d: 99) (4♀♀: HWIC)

Poppea formosa (Butler, 1877):

Chiriquí: Potrerillos, Fortuna, Las Lagunas, Volcán (8♀♀, 1♂: NCSU)

Poppea setosa Fowler, 1895*:

Chiriquí: Fortuna; Colon: Lago Alajuela (3♀♀, 1♂: HWIC)

Spissistilus cornutus (Fowler, 1895):

Chiriquí: Bugaba (Fowler 1895d: 110 as *Stictocephala cornuta* Fowler)

Spissistilus festina (Say, 1830):

Chiriquí: Bambito, Rio Sereno Road, Boquete, Volcán; Colon: Buena Vista; Herrera: Llano Bonito; Panamá: Tumbo Muerto, Tocumen, Qda. Chanis, Campus Univ. de Panama (13♀♀, 20♂♂: HWIC, MIUP)

Stictolobus minor (Fowler, 1895):

Darien: Cana Mine Trail, Cana Station, Cana Boca de Cupe Trail, Cana Airstrip, Cana River Trail (5♀♀, 2♂♂: DJFC)

Vestistilus testaceus (Fairmaire, 1846):

Chiriquí: 3 km. W Cerro Punta; Panamá: 8 km. S Ipeti (1♀, 1♂: DJFC, STRI)

Vestistiloides nigrovittata (Fowler, 1895)*:

Chiriquí: Fortuna, Continental Divide Trail (3♀♀: UGCA, HWIC)

Vestistiloides uncicornis (Fowler, 1895):

Chiriquí: Volcán de Chiriquí (Fowler 1895d: 104 as *Ceresa unicolornis* Fowler). Goding 1929e: 261 synonymized both *Ceresa unicolornis* [sic] Fowler and *Ceresa variabilis* Fowler with *Ceresa brunnicornis* (Germar), giving their Panama location records for *Ceresa brunnicornis*. Andrade (2003) created the genus *Vestistiloides* including both *Ceresa unicolornis* Fowler (Type locality: Volcán de Chiriquí, Panama) and *Ceresa variabilis* Fowler (Type locality: Volcán de Chiriquí, Panama). Andrade (2004) validates *Ceresa brunnicornis* Fowler as a separate species from *Vesistiloides unicolornis* (Fowler) and lists its geographical distribution as Brazil and

Argentina.

Vestistiloides variabilis (Fowler, 1895):

Bocas del Toro: Chiriquí Grande; Chiriquí: Bugaba, Volcán de Chiriquí (Fowler 1895d: 105 as *Ceresa variabilis* Fowler); Panama: Campus Universitario de Panama (Panama City) (1 ♀, 3 ♂♂: DJFC, MIUP)

Poppea Incertae sedis

Poppea zebrina Funkhouser, 1930:

Colon: Barro Collo [Barro Colorado Island] Canal Zone (Funkhouser 1930a: 416)

Microtalini Haupt, 1929

Microtalis atrovana Goding, 1930*:

Bocas del Toro: Corriente Grande; Canal Zone: Pipeline Road; Chiriquí: Los Planes; Panama: Las Cumbres, El Llano-Carti Road (7 ♀♀, 3 ♂♂: DJFC, HWIC)

Microtalis bella Goding, 1929*:

Bocas del Toro: Chiriquí Grande; Canal Zone: Pipeline Road; Panama: Lago Alajuela (1 ♀, 3 ♂♂: DJFC, UDCC, MIUP)

Microtalis binaria (Fairmaire, 1846)*:

Bocas del Toro: Corriente Grande; Chiriquí: Potrerillos, Los Planes, 7 km. SE Fortuna Dam, Fortuna, Cuesta de Piedra, 2 km. W Caldera; Cocle: Cerro Campana; Colon: Barro Colorado Is, Altos de Lago-Madden, Alajuela Lago, Rio Guanche, Pipeline Road; Darien: Cana River Trail; Panama: Llano-Carti Road (km. 8), Cerro Jefe, Nuevo Emperador (Arraijan), nr. Rodman, Las Cumbres, Cerro Campana, Lago Alajuela, Madden Forest, nr. Rodman (45 ♀♀, 29 ♂♂: DJFC, DMWC, NCSU, STRI, HWIC, UDCC, UGCA, MIUP)

Microtalis calva (Say, 1830):

Panama: Lago Alajuela (1 ♀: MIUP)

Microtalis dubia Fowler, 1895 (revalidated Sakakibara 1999b):

Bocas del Toro: Isla Colon (3 km. W Bocas del Toro); Chiriquí: Quebrada Gato, 3 km. W Cerro Punta, Potrerillos, Volcán, Fortuna, Alto Quiel, Rio Sereno Road, nr. Santa Clara; Cocle: Altos de Campaña; Panama: Cerro Campaña (19 ♀♀, 8 ♂♂: DJFC, NCSU, HWIC, UDCC, UGCA)

Microtalis flavozonata (Fairmaire, 1846)*: [formerly in *Acutalis* (McKamey 1999), n. comb. Sakakibara, 1999a]

Chiriquí: Guadalupe Arriba 1 ♀: HWIC)

Microtalis henki Sakakibara, 1999**:

Bocas del Toro: Miramar; Canal Zone: Pipeline Road; Colon: Barro Colorado Is, Pipeline Road; Panama: Las Cumbres; San Blas: nr. Punta Escoces (5 ♀♀, 3 ♂♂: HWIC)

Microtalis infuscata Sakakibara 1999:

Chiriquí: Alto Quiel, Los Planes; Colon: Barro Colorado Is; Panama: Los Cumbres, .3 km. W El Llano (7 ♀♀, 3 ♂♂: DJFC, HWIC, UGCA, MIUP)

Microtalis lugubrina (Stål, 1862):

Chiriquí: Volcán de Chiriquí (Fowler 1895e: 120)

Microtalis malleifera Fowler, 1895*:

Cocle: La Mesa above El Valle (1 unknown sex: DJFC)

Microtalis pallens Fowler, 1895*:

Colon: Quebrada Lopez; Panama: El Llano-Carti Road (km 8.5 & km 8.0), Cerro Jefe (4 ♀♀: DJFC)

Microtalis stipulipennis Buckton, 1902*:

Chiriquí: 7 km. SE Fortuna Dam (1 ♀: DJFC)

Microtalis trifurcata (Goding, 1893)*: (*M. melanogramma* (Perty) in McKamey 1999)

Chiriquí: Los Planes; Cocle: Altos de Campaña; Canal Zone: Pipeline Road; Colon: Canal Zone-Barro Colorado Is, Panama: Las Cumbres (31 ♀♀, 13 ♂♂, 1 unknown sex-no abdomen: DJFC, HWIC, UGCA)

Trachytalis retrofasciata (Lethierry, 1890): (new comb. Sakakibara 1999b)

Canal Zone: Pipeline Road; Colon: Pipeline Road, Barro Colorado Is (4♀♀, 3♂♂: HWIC)

Polyglyptini Goding, 1892

Adippe alliacea (Germar, 1835):

Chiriquí: Hartmann's Finca (2♀♀: UGCA); (Fowler 1896b:135 as *A. concinna*): Bugaba

Adippe histrio (Walker, 1858)*:

Darien: N. Darien, Pirre Est. Rancho Frio, Cana Camp Pirre (1♀, 2♂♂: DJFC, MIUP).

Adippe inaequalis Fowler, 1896:

Bocas del Toro: Corriente Grande; Chiriquí: nr. Volcán (along shore of Lagunas de Volcán), (Fowler 1896b:136): Bugaba Volcán de Chiriquí; Colon: Portobelo, Gatun, Barro Colorado Island; Los Santos: (Fowler 1896b:136): Pena Blanca ; Panamá: Cerro Galera, Cerro Galera; Veraguas: Parque Nac. Sante Fe (18♀♀, 20♂♂, 1 sex unknown: DJFC, STRI, STRI-W, UDCC, UGCA)

Adippe pardalina Fowler, 1896:

Chiriquí: Potrerillos, Volcán de Chiriquí: (Fowler 1896b:134); Panamá: Cerro Campana (2♀♀, 8♂♂: DJFC, NCSU, UDCC)

Adippe zebrina (Fairmaire, 1846):

Chiriquí: Potrerillos, La Fortuna Continental Divide Trail, Volcán de Chiriquí (Fowler 1896b:134 as *A. maculata*) (1♂, 1 sex unknown: DJFC, NCSU)

Aphetea bicolor flava Goding, 1926*:

Colon: Pipeline Road; Panamá: Gamboa nr. Pipeline Road (3♀♀: DJFC, UDCC)

Aphetea inconspicua Fowler, 1895*:

Chiriquí: nr. Chiriquí: Alto de Campaña; Cocle: Altos de Campaña; Colon: Barro Colorado Is, Pipeline Road; Panamá: Fort Kobbe, El Llano-Carti Road, Las Cumbres, Gamboa nr. Pipeline Road; Veraguas: 2 km. NE Santa Fe (15♀♀, 21♂♂, 2 no abdomen, sex unknown: DJFC, HWIC, UDCC, UGCA, MIUP)

Aphetea maculata Funkhouser, 1927*:

Colon: Pipeline Road (1♀, 1♂: HWIC)

Ennya chrysura (Fairmaire, 1846):

Chiriquí: Mina Cerro Colorado, Las Lagunas (4 km. W Hato del Volcán) (2♀♀: DJFC, HWIC)

Ennya conspersa (Stål, 1869):

Darien: Cana Mine Trail (1♂, 1-no abdomen, sex unknown: DJFC)

Ennya pacifica (Fairmaire, 1846):

Chiriquí: nr. Santa Clara, Renacimiento Oeste Clara (2♀♀: STRI)

Entylia carinata (Forster, 1771):

Bocas del Toro: Miramar, Isla Colon; Chiriquí: Potrerillos, Cerro Pando Road (Volcán), Fortuna, Boquete, Volcancitos, Bambito, Rio Sereno Road, Volcán, Hartmann Finca, Fortuna (Continental Divide Trail), nr. Volcán along the shore of Lagunas de Volcán, 1 km. N Boquete; Cocle: El Valle; Panamá: Cerro Jefe, Las Cumbres; Veraguas: 2 km. NW Santa Fe (28♀♀, 36♂♂, 2-unknown sex: NCSU, HWIC, UDCC, UGCA, MIUP)

Metheisa lucillodes Fowler, 1896:

Chiriquí: 4 km. NE Santa Clara, Fortuna (Continental Divide Trail), nr. Volcán along shore of Lagunas de Volcán, (Fowler 1896b: 132: Bugaba and Volcán de Chiriquí); Colon: Pipeline Road km. 10; Darien: 8.5 km. S El Real; Panamá: Madden Forest, Gamboa (Plantation Road), Cerro Campana Parque Nacional, Altos de Campaña (68♀♀, 23♂♂: DJFC, STRI, UDCC, MIUP)

Polyglypta costata Burmeister, 1835:

Chiriquí: Potrerillos, 3 km. N Cerro Punta, 3 km. W Cerro Punta, Los Planes, Bambito, Alto Quiel, Volcán, Volcancitos, P. N. Volcán Baru, Boquette (Palmira Arriba), Finta la Suiza, Quebra Aleman Trail; Cocle: El Valle, La Mesa (ab. El Valle), La Campaña Finca (Valle de Anton), Cerro Cara de Iguana (El Valle de Anton), Altos de Campaña; Panamá: Cerro Campaña, Universidad de Panamá (57♀♀, 41♂♂: DJFC, NCSU, STRI-W, UGCA, MIUP)

Polyglypta dorsalis Burmeister, 1836*:

Chiriquí: Los Planes, nr. Chiriquí, Fortuna, Volcán Baru, Horrito (3 ♀♀, 3 ♂♂: DJFC, MIUP)

Polyglypta lineata Burmeister, 1836:

Canal Zone: (Funkhouser 1951a: 143)

Polyglyptodes viridis Plummer, 1936*:

Chiriquí: 6 S Los Planes (4 ♀♀, 2 ♂♂: DJFC)

Smiliini Incertae sedis (Wallace, 2011)

Antianthe chichiana Funkhouser, 1943*:

Chiriquí: Fortuna, Potrerillos, Rio Colorado, Curundu (Contractor's Area), Volcancito[s]; Veraguas: Santa Fe, Camino a Cero Tute (11 ♀♀, 4 ♂♂: HWIC, MIUP)

Antianthe expansa (Germar, 1835):

Chiriquí: Volcancito[s], Bambito, Boquete, Parque Internacional La Amistad, Alanje, nr. Parque Nacional Volcán Baru, (Fowler 1896c:137: Volcán de Chiriquí); Cocle: La Mesa above El Valle (26 ♀♀, 2 ♂♂: DJFC, HWIC, UDCC, MIUP)

Antianthe expansa humilis Fowler, 1896:

Chiriquí: Fowler 1896c:138: Bugaba

Antianthe foliacea (Stål, 1864)*:

Chiriquí: Las Nubes (4 km. NW Cerro Punta) (1 ♂: DJFC).

Tropidarnis tectigera Fowler, 1895*:

Colon: Barro Colorado Is (1 ♂: HWIC)

Telamonini Goding, 1926

Telamona salvini Distant 1871*

Chiriquí: 1 km. SE Hornito (1 ♀: DJFC)

Tragopini Stål, 1866

Anobilia nigra Tode, 1966*:

Colon: Barro Colorado Is, Pipeline Road, Gatun (2 ♀♀, 5 ♂♂: HWIC)

Chelyoidea aenea (Perty, 1834)*:

Colon: Barro Colorado Is, Pipeline Road; Panama: Cerro Campana, Llano-Carti Road (km. 8 & 9), Fort Kobbe, Cerro Galera (7 ♀♀, 26 ♂♂, 1 unknown sex-no abdomen: DJFC, HWIC)

Horiola ferruginea Fairmaire, 1846*:

Panama: Pipeline Road (1 ♂: UDCC)

Horiola picta (Coquebert, 1801):

Colon: Barro Colorado Is (Canal Zone), Pipeline Road, 8 km. SW Gatun (Canal Zone), Quebrada Lopez, Rio Guanche (5 km. S Portobelo), Santa Rita Ridge Road, Madden Dam, Achioté, Barro Colorado Is, 20 km. NE Portobelo; Darien: 8.5 km. S El Real, Cana Field Station; Panama: Llano-Carti Road (km. 8 & 9), Las Cumbrés, Cerro Campana, Panama City (La Alameda), Madden Forest, Altos de Campaña, Lago Alajuela, Bayano, Camino del Oleoducto, Pipeline Road, nr Gamboa on Plantation Road, Gamboa nr Pipeline Road, P. N. Altos de Campaña (43 ♀♀, 53 ♂♂: DJFC, STRI, HWIC, UDCC, UGCA, MIUP)

Stilbophora xanthocephala (Germar, 1821):

Chiriquí: Goding 1929e: 302 lists *Tragopa bugabensis* Fowler as synonym for *Stilbophora xanthocephala*, giving Fowler's *Tragopa bugabensis* Panama location (Bugaba) for *Stilbophora xanthocephala*. McKamey 1998: 296–297 lists both *Stilbophora xanthocephala* and *Tragopa bugabensis* as valid species with Panama locations. No specimens of *Stilbophora xanthocephala* have been seen by the author.

Tragopa albifascia Funkhouser, 1922*:

Colon: Cerro Viejo Mine Road (10 km. SW Numbre de Dios) (1 ♀: DJFC)

Tragopa bugabensis Fowler, 1895:

Chiriquí: Fowler 1895c: 85: Bugaba; Colon: Barro Colorado Is, Pipeline Road (km. 11); 6 km. E Maria Chiquita, Santa Rita Ridge Road; Panama: El Llano-Carti Road, Las Cumbres (4 ♀♀, 13 ♂♂: DJFC, STRI, MIUP)

Tragopa insignis Fowler, 1895:

Chiriquí: Fowler 1895c: 85: Bugaba

Stegaspinae, Haupt, 1929

Microcentrini Deitz, 1975

Centruchoides laticornis Fowler, 1896:

Chiriquí: 7 km. SE Fortuna Dam, 5 km. N Horrito, (Fowler 1896e: 162: Bugaba and Volcán de Chiriquí); Vera-guas: Alto de Piedra above Santa Fe (3 ♀♀: DJFC, HWIC, UGCA)

Centruchoides oppugnans (Walker, 1858)*:

Bocas del Toro: Corriente Grande; Chiriquí: Continental Divide Trail (1 ♀, 1 ♂: UGCA, HWIC)

Microcentrus cucullatus Fowler, 1896:

Chiriquí: Volcán de Chiriquí. (Fowler 1896e: 161) and Bugaba (Cryan *et al* 2003:25)

Microcentrus perditus (Amyot & Serville, 1843):

Goding 1928a: 397 synonymizes *Microcentrus perditus* (Amyot & Serville) with *Centruchoides laticornis* Fowler, listing it under a new name combination of *Centruchoides perditus* (Amyot & Serville), using Fowler's collection sites of Bugaba and Volcán de Chiriquí for *C. laticornis* (Fowler 1896e: 162). McKamey lists *Centruchoides laticornis* Fowler as a valid species found in Panama (McKamey 1998:300) and perpetuates Goding's citation of *Microcentrus perditus* (Amyot and Serville) being found in Panama (McKamey 1998:301). Cryan *et. al.* lists *Centruchoides laticornis* Fowler as being found in Panama and Honduras (2003:14) and *Microcentrus perditus* (Amyot & Serville) as only being found outside of the United States in Mexico and Canada (2003:35) therefore Goding's record of *M. perditus*'s presence in Panama was an error.

Stegaspini Haupt, 1929

Lycoderes (Lycoderides) phasianus Fowler, 1896:

Chiriquí: Fowler 1896e: 164: Bugaba; Colon: Fort Sherman; Panama: Cerro Jeffe (2 ♀♀: UDCC)

Lycoderes (Lycoderides) serraticornis Fowler, 1896:

Chiriquí: 5 km. N Hornito, 25 km. W Cerro Punta, (Fowler 1896e: 165: Volcán de Chiriquí); Panama: Llano-Carti Road (2 ♀♀, 1 ♂: DJFC)

Smerdalea horrescens Fowler, 1896:

Chiriquí: Fowler 1896e: 163: Bugaba and Volcán de Chiriquí

Stegaspis fronditia (Linnaeus, 1758)*:

Darien: Cana River Trail; Panama: Llano-Carti Road (km. 8)(8 ♀♀, 4 ♂♂: DJFC, UDCC)

Stylocentrus ancora (Perty, 1834):

Chiriquí: Goding 1928a: 398: Bugaba

Stylocentrus championi Fowler, 1896:

Chiriquí: Fowler 1896e: 164: Bugaba and Volcán de Chiriquí; Cocle: Altos de Campaña; Herrera: Cerro alto Higo (15 km. SW Las Minas) (1 ♀, 1 ♂: DJFC, UGCA)

Umbelligerus woldai Sakakibara, 1981:

Bocas del Toro: Type locality: Miramar; San Blas: nr. Punta Escoces (5 ♀♀, 1 ♂: HWIC)

Membracidae Incertae sedis

Tolania armata Goding, 1927*:

Panama: Cerro Campana (1♂: DJFC)

Centrotus obscurus (Germar, 1835)*: (formerly in *Tolania*)

Colon: Barro Colorado Island (2♀♀: STRI)

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Literature cited

- Albertson, J.L. & Dietrich, C.H. (2005) Systematics and phylogeny of the Neotropical treehopper subfamily Nicomiinae (Hemiptera, Membracidae). *Revista Brasileira de Zoologia*, 22(1), 231–283.
- Albertson, J.L. & Dietrich, C.H. (2006) Revision of the Neotropical treehopper genus *Tolania* (Hemiptera, Membracidae). *Revista Brasileira de Zoologia*, 23(4), 915–993.
- Andrade, G.S. (2003) *Vestistiloides*, um novo gênero de Ceresini (Hemiptera, Auchenorrhyncha, Membracidae). *Revista Brasileira de Zoologia*, 20(1), 1–2.
- Andrade, C.G. (2004) As espécies de gênero *Ceresa* Amyot & Servile (Hemiptera, Auchenorrhyncha, Membracidae). *Revista Brasileira de Zoologia* 21(4), 671–738.
- Arnett Jr., R.H., Samuleson, G.A. & Nishida, G.M. (1993) Insect and Spider Collections of the World. 2nd edition. Sandhill Crane Press, Gainesville, Florida. 310 pp.
- Bickley, W.E. & Seek, T.R. (1975a) Insects in four Maryland marshes. Maryland Agriculture Experiment Station Miscellaneous Publication 870. 27 pp.
- Box, H.E. (1929b) Algunos Membrácidos de Tucumán y Jujuy. Contribución para un Catálogo de las especies argentinas de la familia Membracidae (Hemiptera-Homoptera). *Sociedad Entomológica Argentina Revista*, 2, 217–218.
- Broomfield, P.S. (1976a) A revision of the genus *Amastris* (Homoptera: Membracidae). Bulletin of the British Museum (Natural History), *Entomology*, 33(4), 347–460.
- Bartlett, C.R., Deitz, L.L., Rothschild, M.J. & Wallace, M.S. (2008) Treehopper Diversity (Hemiptera: Membracidae) of Little Orleans, Alleghany Co., Maryland. *Proceedings of Entomological Society of Washington*, 110(1), 130–143.
- Brimley, J.F. (1929a) Hemiptera found in the Rainy River District. *Canadian Field Naturalist*, 43, 28–30 [85–103].
- Brimley, C.S. (1938a) Order Homoptera. The Insects of North Carolina. *Being a list of the insects of North Carolina and their closer relatives*, 1938, 1–560.
- Brittain, W.E. (1918a) The tree hoppers of Nova Scotia. *Entomological Society of Nova Scotia Proceedings*, 3, 7–14.
- Britton, W.E. (1920a) Check-list of the insects of Connecticut. *Connecticut State Geological Natural History Survey Bulletin*, 31, 45–56.
- Britton, W.E. (1938c) Additions to the Check-list of the insects of Connecticut. *Connecticut State Geological Natural History Survey Bulletin*, 60, 1–169 [21–27]
- Brodie, W. & White, J.E. (1883a) Check list of insects of the Dominion of Canada. 1883, 1–67 [58–59].
- Buckton, G.B. (1903b) A monograph of the Membracidae, to which is added a paper entitled suggestions as to the meaning of the shapes and colors of the Membracidae in the struggle for existence by Edward B. Poulton. 296 pp.
- Campos, F. (1921a) “Sinopsis de los Membrácidos del Ecuador”. *Revista de la Colegio Nacional Vicente Rocafuerte* 5, 16–19.
- Ceballos-Bendezú, I. (1967a) Sinopsis bibliográfica de los Membracidae (Hemiptera: Homoptera) del Perú. *Revista de la Peruana Entomología*, 10(1), 3–12.
- Ceballos-Bendezú, I. (1980a) Nueva synopsis de los Membracidae (Homoptera: Auchenorrhyncha) del Peru. *Revista de la Peruana Entomología*, 23(1), 39–58.
- Ceballos-Bendezú, I. (1981a) Lista de insectos de Kallanqa, Cusco. *Revista de la Peruana Entomología*, 24(1), 75–80.

- Christensen, J.R. (1943a) Lista de Membracidae encontrados en la Argentina y Algunos Países Limitrofes. *Revista de la Sociedad Entomológica Argentina*, 11, 440–445.
- Costa, J.F. (2009) Membrácidos (Hemiptera: Membracidae) de los bisques nublados en el Parque Nacional del Manu (PNM). Cusco, Perú. *Boletín del Museo de Entomología de la Universidad del Valle*, 10(1), 8–13.
- da Costa Lima, A.M. (1942a) Homópteros. *Insectos do Brasil*, 3, 1–327.
- Creão-Duarte, A.J. & Sakakibara, A.M. (1996) Revisão do gênero *Potnia* Stål (Homoptera, Membracidae, Membracinae, Hoplophorini). *Revista Brasileira de Zoologia*, 13(4), 1001–1021.
- Creão-Duarte, A.J. & Sakakibara, A.M. (2000a) Revisão do gênero *Harmonides* Kirkaldy (Hemiptera, Membracidae, Smiliinae). *Revista Brasileira de Zoologia*, 17(2), 305–313.
- Creão-Duarte, A.J. & Sakakibara, A.M. (2000b) Revisão do gênero *Tynelia* Stål descrição de um novo gênero correlato (Hemiptera, Membracidae, Smiliinae). *Revista Brasileira de Zoologia*, 17(3), 561–572.
- Cryan, J.R. & Deitz, L.L. (1999a) Review of the New World Treehopper Tribe Stegaspidini (Hemiptera: Membracidae: Stegaspidinae): I. *Bocyidium* Latrielle, *Lirania* Stål, and *Smerdalea* Fowler. *Proceedings of Entomological Society of Washington* 101(3), 469–489.
- Cryan, J.R., Robertson, J.A. & Deitz, L.L. (2003) The New World Treehopper Tribe Microcentrini (Hemiptera: Membracidae: Stegaspidinae): Monographic Revision and Phylogenetic Position. Thomas Say Publications (Monographs of the Entomological Society of America), 108 pp.
- Curran, C.H. (1929a) Some insects from Barro Colorado. A region of the Panama Canal Zone where insects of peculiar shapes and habits carry on the neverending struggle for existence – how they kill in turn fall prey to enemies. *Natural History*, 29, 611–620.
- Deay, H.O. & Gould, G.E. (1935a) An annotated list of the Membracidae of Indiana (Homoptera). *Indiana Academy of Science Proceedings*, 44, 236–243.
- Deitz, L.L. (1989a) Bibliography of the Membracoidea (Homoptera: Aethalionidae, Biturritiidae, Membracidae, and Nicomiidae) 1981–1987. North Carolina Agricultural Research Service Technical Bulletin 290. 32 pp.
- Deitz, L.L. & Kopp, D.D. (1987a) Bibliography of the Membracoidea (Homoptera: Aethalionidae, Biturritiidae, Membracidae, and Nicomiidae) 1956–1980. North Carolina Agricultural Research Service Technical Bulletin 284, 39 pp.
- Dennis, C.J. (1951a) A list of the Wisconsin species of Membracidae. *Canadian Entomologist*, 83, 183–184.
- Dennis, C.J. (1952b) The Membracidae of Wisconsin. *Wisconsin Academy of Science, Arts, and Letters Transactions*, 41, 129–152.
- Dennis, C.J. (1963a) Membracidae in a southern Oklahoma woods. *Proceedings of the Oklahoma Academy of Science*, 43, 95–98.
- Dennis, C.J. (1964c) Membracidae of southeastern Oklahoma. *Proceedings of the Oklahoma Academy of Science*, 44, 47–51.
- Dennis, C.J. (1965a) Oklahoma treehoppers (Homoptera: Membracidae). *Proceedings of the Oklahoma Academy of Science*, 45, 50–64.
- Dennis, C.J. & Dicke, R.J. (1953a) The Membracidae of the University of Wisconsin Arboretum. *Transaction of the Wisconsin Academy of Science, Arts, and Letters*, 42, 131–141.
- Dietrich, C.H. & Deitz, L.L. (1991a) Revision of the Neotropical treehopper tribe Aconophorini (Homoptera: Membracidae). North Carolina Agricultural Research Service Technical Bulletin 293. 134 pp.
- Dietrich, C.H., Rothschild, M.J. & Deitz, L.L. (1999) Checklist and host plants of the treehoppers (Hemiptera: Membracidae) of North Carolina. *Proceedings of the Entomological Society of Washington*, 101, 242–262.
- Downes, W. (1920a) The tree-hoppers of British Columbia. *British Columbia Entomological Society Proceedings*, 1920, 17–19.
- Flynn, D.J. (2003) Subgenera of *Cladonota* Stål (Hemiptera: Membracidae) with two new species from Mexico. *Proceedings Entomological Society of Washington*, 105(2), 320–330.
- Fowler, W. (1894b) Order Rhynchota. Suborder Hemiptera-Homoptera. *Biologia Centrali-Americana*, 2, 1–24.
- Fowler, W. (1894c) Order Rhynchota. Suborder Hemiptera-Homoptera. (Continued). *Biologia Centrali-Americana*, 2, 25–56.
- Fowler, W. (1895a) Order Rhynchota. Suborder Hemiptera-Homoptera. (Continued). *Biologia Centrali-Americana*, 2, 57–72.
- Fowler, W. (1895b) Order Rhynchota. Suborder Hemiptera-Homoptera. (Continued). *Biologia Centrali-Americana*, 2, 73–80.
- Fowler, W. (1895c) Order Rhynchota. Suborder Hemiptera-Homoptera. (Continued). *Biologia Centrali-Americana*, 2, 81–88.
- Fowler, W. (1895d) Order Rhynchota. Suborder Hemiptera-Homoptera. (Continued). *Biologia Centrali-Americana*, 2, 89–112.
- Fowler, W. (1895e) Order Rhynchota. Suborder Hemiptera-Homoptera. (Continued). *Biologia Centrali-Americana*, 2, 113–120.
- Fowler, W. (1895f) Order Rhynchota. Suborder Hemiptera-Homoptera. (Continued). *Biologia Centrali-Americana*, 2, 121–128.
- Fowler, W. (1896b) Order Rhynchota. Suborder Hemiptera-Homoptera. (Continued). *Biologia Centrali-Americana*, 2, 129–136.
- Fowler, W. (1896c) Order Rhynchota. Suborder Hemiptera-Homoptera. (Continued). *Biologia Centrali-Americana*, 2, 137–144.
- Fowler, W. (1896d) Order Rhynchota. Suborder Hemiptera-Homoptera. (Continued). *Biologia Centrali-Americana*, 2, 145–160.
- Fowler, W. (1896e) Order Rhynchota. Suborder Hemiptera-Homoptera. (Continued). *Biologia Centrali-Americana*, 2, 161–168.
- Freytag, P.H., Covell Jr., C.V. & Kopp, D.D. (1981a) An annotated check list of the treehoppers (Homoptera: Membracidae) of Kentucky. *Entomological News*, 92(4), 133–137.
- Funkhouser, W.D. (1917a) Biology of the Membracidae of the Cayuga Lake Basin. *Cornell University Agriculture Experiment Station Memoir*, 2, 177–445.
- Funkhouser, W.D. (1923c) Family Membracidae In Britton's Guide to the insects of Connecticut. Part IV. The Hemiptera or sucking insects of Connecticut. *Connecticut State Geological and Natural History Survey Bulletin*, 34, 163–206.
- Funkhouser, W.D. (1927f) Membracidae. General catalogue of the Hemiptera. *Fascicle*, 1, 1–581.
- Funkhouser, W.D. (1930a) New genera and species of Neotropical Membracidae. *New York Entomological Society Journal*, 38, 405–421.
- Funkhouser, W.D. (1943d) Membracidae of Guatemala. *Entomological Society of America Annals*, 36, 455–482.
- Funkhouser, W.D. (1951a) Homoptera Family Membracidae. Genera Insectorum 208. 383 pp.
- Gillette, C.P. & Baker, C.F. (1895a) A preliminary list of the Hemiptera of Colorado. *Colorado Agricultural Experiment Station Bulletin*

tin, 31, 1–137 [64–113]

- Goding, F.W. (1893a) Bibliographical and synonymical catalogue of the described Membradae of North America. *Illinois State Laboratory of Natural History Bulletin*, 3, 391–482.
- Goding, F.W. (1893b) The Membracidae of St. Vincent Island, W. I. *Canadian Entomologist*, 25, 53–56.
- Goding, F.W. (1914a) Catalogue of the Membracidae of Uruguay (Hemip., Homopt.). *Entomological News*, 25, 397–403.
- Goding, F.W. (1920a) The known Membracidae of Ecuador. (Homopt.). *Entomological News*, 31, 135–136.
- Goding, F.W. (1920b) The known Membracidae of Ecuador. (Homopt.). *Entomological News*, 31, 155–159.
- Goding, F.W. (1920c) Sinopsis de los Membracidos del Ecuador. (Insectos Hemipteros, suborden Homópteros). *Boletín de Medicina y Cirugía [Guayaquil]*, 18, 31–37.
- Goding, F.W. (1921a) Sinopsis de los Membracidos del Ecuador. (Insectos Revista Colegio. Nacional Hemipteros, suborden Homópteros). *Vicente Rocafuerte*, 5, 3–15.
- Goding, F.W. (1925b) Synopsis of the Membracidae of Chile. *Revista Cileana de Historia Natural*, 27, 118–123.
- Goding, F.W. (1926e) Classification of the Membracidae of America. *New York Entomological Society Journal*, 34, 295–317.
- Goding, F.W. (1928a) The Membracidae of South America and the Antilles. II. Subfamily Centrotinae. *New York Entomological Society Journal*, 35, 391–408.
- Goding, F.W. (1928d) New Membracidae, VII. *Brooklyn Entomological Society Bulletin*, 23, 137–142.
- Goding, F.W. (1928e) The Membracidae of South America and the Antilles. III. Subfamily Membracinae. *New York Entomological Society Journal*, 36, 201–234.
- Goding, F.W. (1929e) The Membracidae of South America and the Antilles. IV. Subfamilies Hoplophorioninae, Darninae, Smiliinae, Tragopinae (Homoptera). *American Entomological Society Transactions*, 55, 197–330.
- Godoy, C., Miranda, X., & Nishida, K. (2006) Membrácidos de la América tropical. Treehoppers of tropical America. Instituto Nacional de Biodiversidad (INBio). 352 pp.
- Haupt, H. (1953a) Insekten mit rätselhaften Verzierung. *Akademische Verlagsgesellschaft Geest and Portig K.-G., Leipzig*, 104, 3–57.
- Haviland, M.D. (1925a) The Membracidae of Kartabo, Bartica District, British Guiana, with descriptions of new species and bionomical notes. *Zoologica [New York]*, 6, 229–290.
- Hendrickson, G.O. (1928a) Some notes on the insect fauna of an Iowa prairie. *Entomological Society of America Annals*, 21, 132–138.
- Hendrickson, G.O. (1930a) Studies on the insect fauna of Iowa prairies. *Iowa State College Journal of Science*, 4, 49–179.
- Hookum, D.W. (1931a) A study of the Membracidae known to occur in Iowa. *Iowa Academy of Science Proceedings*, 37, 385–386.
- Johnson, M.P. & Freytag, P.H. (1997) Treehoppers (Homoptera: Membracidae) on Pin Oak in Kentucky. *Journal of Kansas Entomological Society*, 70(1), 21–30.
- Jones, H.C. (1937a) The Membracidae of Nebraska (Homoptera). *Entomological News*, 48, 69–74.
- Jorgensen, D.D. (1935a) Studies in Utah Membracidae. *Utah Academy of Science, Arts, and Letters Proceedings*, 12, 211–225.
- Kopp, D.D. & Yonkem, T.R. (1970a) Treehoppers (Homoptera: Membracidae) of Tucker Prairie. *Transactions of Missouri Academy of Science*, 4, 72–75.
- Kopp, D.D. & Yonke, T.R. (1970b) Annotated list of treehopper species (Homoptera: Membracidae) of Missouri and evaluation of collection methods. *Transactions of Missouri Academy of Science*, 4, 76–83.
- Kopp, D.D. & Yonke, T.R. (1971a) Correction of Table 1 in “Annotated list of treehopper species (Homoptera: Membracidae) of Missouri and evaluation of collection methods”. *Transaction of Missouri Academy of Science*, 5, 3–4.
- Kopp, D.D. & Yonke, T.R. (1973a) The treehoppers of Missouri: Part 1. Subfamilies Centrotinae, Hoplophorioninae, and Membracinae (Homoptera: Membracidae). *Journal of Kansas Entomological Society*, 46(1), 42–64.
- Kopp, D.D. & Yonke, T.R. (1973b) The treehoppers of Missouri: Part 2. Subfamily Smiliinae; tribes Acutalini, Ceresini, and Polyglyptini (Homoptera: Membracidae). *Journal of Kansas Entomological Society*, 46(2), 233–276.
- Kopp, D.D. & Yonke, T.R. (1973c) The treehoppers of Missouri: Part 3. Subfamily Smiliinae; tribe Smiliini (Homoptera: Membracidae). *Journal of Kansas Entomological Society*, 46(3), 375–421.
- Kopp, D.D. & Yonke, T.R. (1974a) The treehoppers of Missouri: Part 4. Subfamily Smiliinae; tribe Telamonini (Homoptera: Membracidae). *Journal of Kansas Entomological Society*, 47(1), 80–130.
- Lawson, P.B. (1922a) The Membracidae of Kansas. *Kansas University Science Bulletin*, 14, 27–110.
- Larivière, M.C. & Laochelle, A. (1988a) An annotated list of the treehoppers (Homoptera: Membracidae) of Quebec. *Entomological News*, 99(2), 111–124.
- Leonard, M.D. (1928a) Families Cercopidae, Membracidae, and Cicadellidae in A list of the insects of New York with a list of spiders and certain other allied groups. *Cornell University Agriculture Experiment Station Memoir*, 101, 1–1121 [145–176].
- Lerch, E.C. (1933a) A list of Homoptera from Ontario. *Brooklyn Entomological Society Bulletin*, 28, 76–78.
- Linnavuori, R.E. & DeLong, D.M. (1978a) The treehoppers (Homoptera: Membracidae) known to occur in Chile. *Bresesia*, 14–15, 171–194.
- Lopes, B.C. (1995) Treehoppers (Homoptera: Membracidae) in southeastern Brazil: use of host plants. *Revista Brasileira de Zoologia*, 12(3), 595–608.
- MacGillivray, A.D. & Houghton, C.O. (1903a) A list of insects taken in the Adirondack Mountains, N.Y.–III. *Entomological News*, 14, 262–265.
- McAtee, W.L. (1921a) Membracidae of the vicinity of Washington, D.C. *Washington Biological Society Proceedings*, 34, 123–133.
- McKamey, S.H. (1991c) Revision of the Neotropical treehopper genus *Metcalfiella* (Homoptera: Membracidae). North Carolina Agricultural Research Service Technical Bulletin 294. 89 pp.
- McKamey, S.H. (1998) Taxonomic catalogue of the Membracoidea (exclusive of leafhoppers): Second supplement to Fascicle 1 – Membracidae of the General Catalogue of the Hemiptera. *Memoirs of the American Entomological Institute*, Volume 60, 1–377.

- Mason, C.E. & Loye, J.E. (1981a) An annotated list of treehoppers (Homoptera: Membracidae) of Delaware. *Entomological News*, 92(1), 33–37.
- Mason, C.E. & Loye, J.E. (1981b) Treehoppers (Homoptera: Membracidae) collected at multiple levels in a deciduous woodlot in Delaware. *Entomological News*, 92(2), 64–68.
- Maw, H.E., Gootit, G.G.E., Hamilton, K.G.A., Footitt, R.G. & Scudder, G.G.E. (2000) Checklist of the Hemiptera of Canada and Alaska. National Research Council of Canada, Ottawa. 223 pp.
- Metcalf, Z.P. (1954c) Homoptera from the Bahama Islands. *American Museum Novitates*, 1698, 1–46.
- Metcalf, Z.P. & Bruner, S.C. (1925b) Membracidae of Cuba. *Brooklyn Entomological Society Bulletin*, 20, 203–214.
- Metcalf, Z.P. & Wade, V. (1965a) General Catalogue of the Homoptera. A Supplement to Fascicle 1 – Membracidae of the General Catalogue of Hemiptera. Membracoidea. In Two Sections. North Carolina State [Univ.], Raleigh. 1552 pp.
- Moore, G.A. (1907a) List of Hemiptera taken at Como, Quebec, during the summer of 1906. *Canadian Entomologist*, 39, 189–191.
- Moore, G.A. (1944a) A list of Hemiptera taken at Hudson Heights, Quebec. *Canadian Entomologist*, 76, 40–44.
- Moore, G.A. (1950a) Catalogue des Hémiptères de la Province de Québec. *Naturaliste Canadien*, 77, 233–271.
- Moore, G.A. (1950b) Liste des Hémiptères de la Province de Québec. Checklist of Hemiptera of the Province of Quebec. *Contributions de l'Institut de biologie de l'Université de Montréal*, 26, 1–49.
- Osborn, H. (1921a) Hemiptera of Florida. *Florida Entomologist*, 5, 1–19.
- Osborn, H. (1926c) Faunistic and ecologic notes on Cuban Homoptera. *Entomological Society of America Annals*, 19, 335–366.
- Osborn, H. (1935a) Insects of Porto Rico and the Virgin Islands. Homoptera (excepting the Sternorhynchi). Scientific Survey of Porto Rico and the Virgin Islands. *New York Academy of Sciences* 14, 111–260.
- Osborn, H. (1940a) The Membracidae of Ohio. *Ohio Biological Survey Bulletin*, 7, 51–101.
- Peláez, D. (1945a) Estudios sobre membrácidos. V. Las especies mexicanas del género *Sphingophorus* Fairmaire (Hem., Hom.). *Anales de la Escuela Nacional de Ciencias Biología*, 4, 53–146.
- Poole, R.W., Garrison, R.W., McCafferty, W.P., Otte, D. & Stark, B.P. (1997) Nomina Insecta Nearctica. A Checklist of the Insects of North America. Volume 4. Non-Holometabolous Orders. Entomological Information Services, Rockville, MD. 731 pp [pp 360–366]
- Ramos, J.A. (1947a) The Insects of Mona Island (West Indies). *Puerto Rico University Journal of Agriculture*, 30, 1–74.
- Ramos, J.A. (1957a) A review of the auchenorrhynchos Homoptera of Puerto Rico. *Puerto Rico Journal of Agriculture*, 41(1), 38–117.
- Ramos, J.A. (1979a) Membracidae de la República Dominicana (Homoptera:Auchenorrhyncha [sic]). Universidad de Puerto Rico (Mayagüez), Estación Experimental Agrícola Boletín 260. 71 pp.
- Ramos, J.A. (1988a) Zoogeography of the Auchenorrhynchos Homoptera of the Greater Antilles (Hemiptera). Pp. 61–70 In Liebherr, J. K. (ed.) *Zoogeography of Caribbean Insects*. Cornell University Press, Ithaca. 285 pp.
- Richter, L. (1940a) Catalogo de los Membracidos de Colombia. *Revista Academia Colombiana de Ciencias*, 3, 462–463.
- Richter, L. (1941b) Catalogo de los Membracidos de Colombia. *Revista Academia Colombiana de Ciencias*, 4, 83–85.
- Richter, L. (1942c) Catalogo de los Membracidos de Colombia. *Revista Academia Colombiana de Ciencias*, 4, 405–409.
- Richter, L. (1945a) Membracidae Colombianae. *Revista Academia Colombiana de Ciencias*, 6, 339–354.
- Richter, L. (1955a) Entomologia. Membracidae Colombianae. *Caldasia*, 6, 269–380.
- Sakakibara, A.M. (1998) Taxonomic Notes on *Darnoides* Fairmaire (Heteronotinae), with description of a new species and other new taxa in Darninae, Cymbomorhini (Hemiptera: Membracidae). *Revista Brasileira de Entomologia*, 42(3–4), 141–146.
- Sakakibara, A.M. (1999) A synopsis of the tribe Micrutalini Haupt (Homoptera, Membracidae, Smiliinae). *Revista Brasileira de Zoologia*, 16 (Supplement 1), 193–220.
- Sakakibara, A.M. (2002) Revaluation of *Ilithucia* Stål and descriptions of new species (Homoptera, Membracidae, Smiliinae). *Revista Brasileira de Zoologia*, (19)1, 189–200.
- Sakakibara, A.M. (2005) The genus *Hypheodana* Metcalf and description of three new species (Hemiptera, Cicadomorpha, Membracidae). *Revista Brasileira de Zoologia*, 22(4), 1116–1120.
- Sakakibara, A.M. & Creão-Duarte, A.J. (2002) Nomenclatural notes in Membracidae (Homoptera): new combination and new synonymies in *Amastris* Stål, 1862. *Revista Brasileira de Entomologia*, 46(2), 227–228.
- Sakakibara, A.M. & Evangelista, O. (2008) New species and nomenclatural notes in the Ceresini (Hemiptera, Membracidae, Smiliinae). *Zootaxa*, 1702, 52–60.
- Severin, H.C. (1921b) A preliminary report upon the Membracidae of South Dakota. *South Dakota State Entomology Annual Report*, 12, 17–18.
- Severin, H.C. (1923b) Second report upon the Membracidae of South Dakota. *South Dakota State Entomology Annual Report*, 14, 27–33.
- Severin, H.C. (1927a) A third report upon the Membracidae (treehoppers) of South Dakota. *South Dakota Academy of Science Proceedings*, 11, 33–49.
- Smith, J.B. (1910a) Order Homoptera in A report of the insects of New Jersey. New Jersey State Museum Annual Report 1909, 1–888 [87–107].
- Strickland, E.H. (1953a) An annotated list of the Hemiptera (S.L.) of Alberta. *Canadian Entomologist*, 85, 193–214.
- Stroud, C.P. (1950a) A survey of the insects of White Sands National Monument, Tularosa Basin, New Mexico. *American Midland Naturalist*, 44, 659–677.
- Van Duzee, E.P. (1889b) Hemiptera from Mukoka Lake District. *Canadian Entomologist*, 21, 1–11.
- Van Duzee, E.P. (1908a) Studies of North American Membracidae. *Buffalo Society of Natural Science Bulletin*, 9, 29–127.
- Van Duzee, E.P. (1908b) List of Hemiptera taken by W. J. Palmer, about Quinze Lake, Province Quebec, in 1907. *Canadian Entomologist*, 40, 109–116.

- Van Duzee, E.P. (1914a) A preliminary list of the Hemiptera of San Diego County, California. *San Diego Society of Natural History Transactions*, 2, 1–57.
- Van Duzee, E.P. (1917b) Suborder Homoptera Latr. 1810. Section Auchenorrhyncha A. & S. 1843. Check list of Hemiptera (excepting the Aphididae, Aleurodidae and Coccidae) of America North of Mexico 1917, 1–111 [55–85].
- Wallace, M.S. (2008) Occurrence of treehoppers (Hemiptera: Membracidae: Smiliinae) on oaks in Delaware Water Gap National Recreation Area 2004–2006. *Journal of Insect Science*, 8(59), 1–16.
- Wallace, M.S. (2011) Morphology-based phylogenetic analysis of the treehopper tribe Smiliini (Hemiptera, Membracidae, Smiliinae), with reinstatement of the tribe Telamonini. *Zootaxa*, 3047, 1–42.
- Wallace, M.S., Deitz, L.L. & Rothschild, M.J. (2003) Checklist of the Treehoppers (Hemiptera: Membracidae) of Great Smoky Mountains National Park. *Proceedings of the Entomological Society of Washington*, 105(3), 578–591.
- Wallace, M.S. & Maloney, S.M. (2010) Treehopper (Hemiptera: Membracidae) Biodiversity and Seasonal Abundance in the Pocono Till Barrens, Long Pond, Pennsylvania. *Proceedings of the Entomological Society of Washington*, 112(2), 281–294.
- Wirtner, P.M. (1904a) A preliminary list of the Hemiptera of Western Pennsylvania. *Carnegie Museum Annals*, 3, 183–232 [209–228].
- Wolcott, G.N. (1927b) Les Homoptères. *Entomologie d’Haiti* 1927, 1–440 [187–193].
- Wolcott, G.N. (1950a) The insects of Puerto Rico. *Puerto Rico University Journal of Agriculture*, 32, 1–224 [103–144].
- Wolda, H. (1979a) Abundance and diversity of Homoptera in the canopy of a tropical forest. *Ecological Entomology*, 4, 181–190.
- Wolda, H. (1980a) Seasonality of tropical insects. I. Leafhoppers (Homoptera) in Las Cumbres, Panama. *Journal of Animal Ecology*, 49, 277–290.
- Wolda, H. (1980b) Fluctuaciones estacionales de insectos en Hornitos (‘Fortuna’) Provincia de Chiriquí. *Con Ciencia*, 7, 8–10.
- Wolda, H. (1982a) Seasonality of Homoptera on Barro Colorado Island. pp. 319–330. In Leigh, E. G. Jr., A. S. Rand, and D. M. Windsor (eds.). *The Ecology of a Tropical Rainforest. Seasonal Rhythms and Long-term Changes*. Smithsonian Institution Press, Washington, D.C. 468 pp.
- Wolda, H. (1983a) “Long-Term” stability of tropical insect populations. *Res. Populations Ecol*, Suppl. 3, 112–126.